

037537027  
JO Rec'd PCT/PTO SEP 20 2001



Hewlett-Packard Limited  
Intellectual Property  
and General Legal Section  
Building 3, Filton Road  
Stoke Gifford  
Bristol BS34 8QZ  
U.K.  
www.hp.com  
+44 (0)117 312 9947 Tel  
+44 (0)117 312 8941 Fax

European Patent Office  
Erhardstraße 27  
D-80298 München  
GERMANY

7 March 2001

Dear Sirs

RE: International application No PCT/GB00/00676  
Applicant: Hewlett-Packard Company et al  
Our ref: 30980107 WO1

The Examiner is thanked for extending the period for response to the Written Opinion by a day permitting fax filing of the response today.

Please find transmitted herewith a response to the Written Opinion and an amended specification, triplicate copies of which will follow by post. The applicant requests that the International Preliminary Examination Report be drawn up on the basis of the amended specification.

Yours faithfully

A handwritten signature in black ink, appearing to read 'M. Lawman', written over a horizontal line.

Matthew Lawman  
Patent Attorney

**INTERNATIONAL PATENT APPLICATION NUMBER:** PCT/GB 00/00676  
**TITLE:** INTELLIGENT MEDIA READER AND LABEL PRINTER  
**APPLICANT:** HEWLETT PACKARD COMPANY

In response to the written opinion under PCT Rule 66, dated December 06, 2000 the applicant makes the following observations:

**RE: ITEM VII**

- 1.0 Whilst the Examiner's comment is noted, the applicant submits that the requirements for Rule 5.1(a)(ii) PCT is met by virtue of the text contained in the section "Background to the Invention" in the specification as filed.

The applicant notes that the national laws of many designated States prohibit the addition of material to a patent specification after filing. Consequently, no amendment is made to the specification to include descriptions or identifications of US 5,455,409, US 5,592,596, or US 4,141,045.

- 1.1 Amendments to the description, pages 6-9, bringing the description into conformity with the claim amendments are made.

The description page 1 introductory paragraph, page 5, line 19, page 9, line 8 and page 11, line 10 are amended.

- 1.2 Reference signs are placed in parenthesis in accordance with Rule 6.2(b) PCT.

**RE: ITEM VIII**

- 1.0 Amendment is made to claim 1 in the form suggested by the Examiner. The applicant submits it is clear from Fig.3 and the accompanying description as filed, that the cartridge type data storage device has an attached memory device 301, and that the portable reader device is capable of reading data in that stored memory device. See text page 16, lines 1-6 of the application as filed, and the Best Mode Description generally.

- 1.1 Amendment is made to claim 1 to include the words "at least some of" after the words "to print" at line 11 of claim 1.

The applicant submits that it is clear from the specification as filed that not all the data received from the receiver means is printed onto a print media. See, for example, the specification as filed page 19, line 9-page 20, line 5. In some modes of operation, all the data stored on the memory device on the cartridge may be printed, and in other modes, not all the data is printed.

- 1.2 Amendment is made to claim 4. It is clear from the specification as filed, see Figs. 2-5 and associated text, that the portable reader device as disclosed comprises a display.

- 1.3 Amendment is made to claim 14. The applicant submits that claim 14 complies with the clarity requirement of Article 6.

- 1.4 The applicant respectfully disagrees with the Examiner and contends that both claims 1 and 14 are each concise, independently, and having claims 1 and 14 in the same international application is also concise.

CORRECTED VERSION

(19) World Intellectual Property Organization  
International Bureau



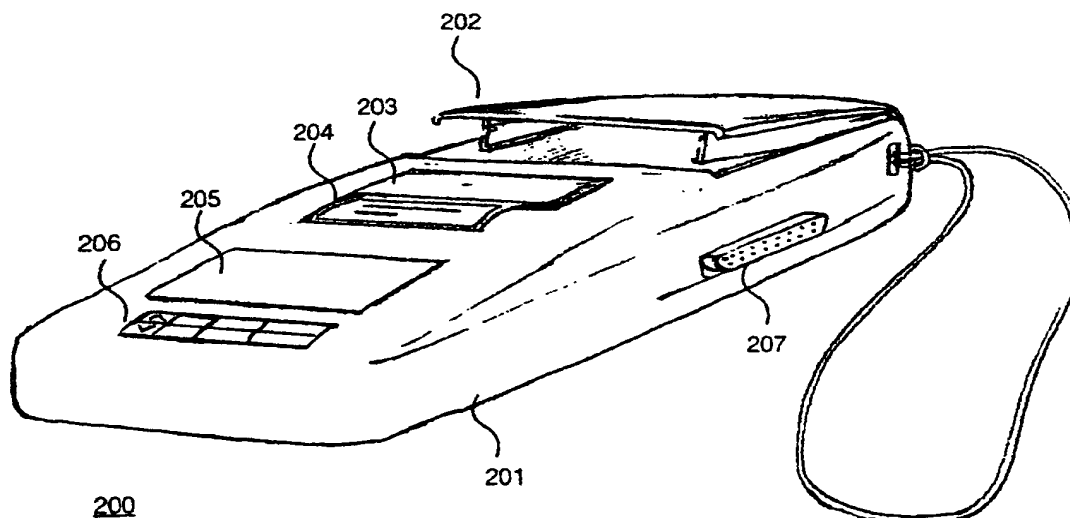
(43) International Publication Date  
28 September 2000 (28.09.2000)

PCT

(10) International Publication Number  
**WO 00/57353 A1**

- (51) International Patent Classification<sup>7</sup>: G06K 17/00 (74) Agent: **LAWMAN, Matthew, John, Mitchell**; Hewlett-Packard Limited, Intellectual Property Section, Filton Road, Stoke Gifford, Bristol BS34 8QZ (GB).
- (21) International Application Number: PCT/GB00/00676
- (22) International Filing Date: 25 February 2000 (25.02.2000) (81) Designated States (*national*): GB, JP, US.
- (25) Filing Language: English (84) Designated States (*regional*): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).<sup>\*</sup>
- (26) Publication Language: English
- (30) Priority Data: 99302266.4 24 March 1999 (24.03.1999) EP Published: — With international search report.
- (71) Applicant (*for all designated States except US*): **HEWLETT-PACKARD COMPANY** [US/US]; 3000 Hanover Street, Palo Alto, CA 94304 (US). (48) Date of publication of this corrected version: 15 March 2001
- (72) Inventors; and (15) Information about Correction: see PCT Gazette No. 11/2001 of 15 March 2001, Section II
- (75) Inventors/Applicants (*for US only*): **GOLD, Stephen** [GB/GB]; Rock Cottage, Stoke Lane, Winterbourne Down, Bristol BS36 1DJ (GB). **CRIGHTON, Ian, Peter** [GB/GB]; 1 Old Manor Cottages, Winterbourne Hill, Winterbourne, Bristol BS36 1JS (GB).
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: INTELLIGENT MEDIA READER AND LABEL PRINTER



(57) Abstract: A hand-held portable reader (200) and labeling device for interrogating data storage cartridges of the type containing an in-built memory chip having information stored describing details of data contained on the data storage medium is disclosed. The reader-labeling device comprises a processor, random access memory, printer (203), display (205), keypad (206), operating system, transponder, receiver and battery power supply. By scrolling a menu display, key parameters describing a data cartridge can be accessed quickly and efficiently without the need to access the data storage medium itself. A cartridge media specific label may be rapidly printed for attachment to a data storage cartridge.

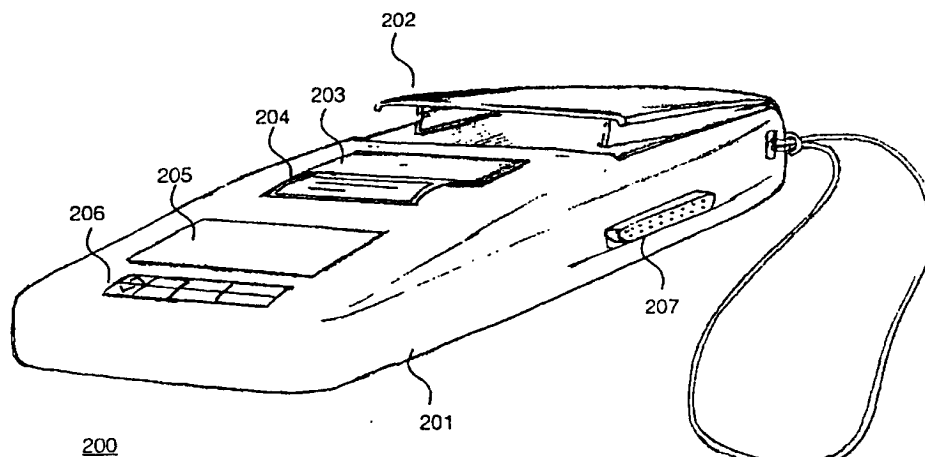
WO 00/57353 A1



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>7</sup> : <b>G06K 17/00</b>	<b>A1</b>	(11) International Publication Number: <b>WO 00/57353</b> (43) International Publication Date: 28 September 2000 (28.09.00)
(21) International Application Number: PCT/GB00/00676 (22) International Filing Date: 25 February 2000 (25.02.00) (30) Priority Data: 99302266.4                      24 March 1999 (24.03.99)                      EP (71) Applicant (for all designated States except US): HEWLETT-PACKARD COMPANY [-/US]; 3000 Hanover Street, Palo Alto, CA 94304 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): GOLD, Stephen [GB/GB]; Rock Cottage, Stoke Lane, Winterbourne Down, Bristol BS36 1DJ (GB). CRIGHTON, Ian, Peter [GB/GB]; 1 Old Manor Cottages, Winterbourne Hill, Winterbourne, Bristol BS36 1JS (GB). (74) Agent: LAWMAN, Matthew, John, Mitchell; Hewlett-Packard Limited, Intellectual Property Section, Filton Road, Stoke Gifford, Bristol BS34 8QZ (GB).		(81) Designated States: GB, JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  Published With international search report.

(54) Title: INTELLIGENT MEDIA READER AND LABEL PRINTER



## (57) Abstract

A hand-held portable reader (200) and labeling device for interrogating data storage cartridges of the type containing an in-built memory chip having information stored describing details of data contained on the data storage medium is disclosed. The reader-labeling device comprises a processor, random access memory, printer (203), display (205), keypad (206), operating system, transponder, receiver and battery power supply. By scrolling a menu display, key parameters describing a data cartridge can be accessed quickly and efficiently without the need to access the data storage medium itself. A cartridge media specific label may be rapidly printed for attachment to a data storage cartridge.

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav	TM	Turkmenistan
BF	Burkina Faso	GR	Greece		Republic of Macedonia	TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's	NZ	New Zealand		
CM	Cameroon		Republic of Korea	PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

7/pst

## INTELLIGENT MEDIA READER AND LABEL PRINTER

### Field of the Invention

The present invention relates to recording medium cartridges of the type  
5 which include a memory device for storing information concerning the cartridge  
and data recorded on the recorded medium, and particularly although not  
exclusively it relates to the manner of reading this information and using it to  
produce a printed label containing all of, or a selected subset of this information.

### Background to the Invention

10 In order to store digital electronic data, such as back-up data from a server  
computer device, it is known to use magnetic tape data storage cartridges  
comprising one or a pair of rotatable reels, and an elongate band of magnetic  
tape. A main reason for using such tape data storage cartridges is to make back  
15 up copies of important data. Customers running large computer installations, or  
research and development facilities having significant amounts of data generated  
may have hundreds or thousands of tape data storage cartridges containing back  
up data, backed up from a wide range of different host devices such as servers  
and computer devices. Large collections of tape data storage cartridges tend to  
20 be stored in centralised library locations, sometimes situated in fire proof safes or  
fire proof rooms. The library storage facility may be geographically remote from  
the host server devices, so that if there is destruction of data on the host devices,  
for example by a fire, the back up data remains safe. When a host device fails  
and data is lost, it is necessary to quickly locate the tape cartridge having the  
25 latest back up data, which may be located in an offsite library.

These libraries include manual access libraries, where the cartridges are  
simply stored on shelves or in racks or boxes, with access to the cartridges being  
by manually picking up the cartridges, or automated libraries, where the

-2-

cartridges are stored in predefined locations on a rack or shelf and are automatically accessed. In a manual access library, to identify a content of a tape cartridge a person may simply write out a label manually, describing the content of the data on the tape cartridge. This process is tedious and prone to error. For example the wrong label might be put on the wrong tape, so that the contents of the label do not coincide with the data of the tape cartridge. Alternatively, tape cartridges have barcodes printed on their external cases, so conventionally finding a particular tape may involve using a barcode scanner to scan a plurality of barcode labels on a plurality of tape cartridges. In the case of an automated library, robotic arms which are software controlled, deposit and collect cartridges in a rack, or shelf, and use a serial number of a tape data storage cartridge to determine a location within the library shelf or rack on which to store the cartridge. The rack or shelf is accessible by the robotic arm which may physically select a required tape on receipt of user instructions, the robotic arm being moved under computer control to a cartridge storage location on the rack or shelf.

Conventionally, a person wishing to find an item of stored data on a cartridge will need firstly to identify the correct cartridge with the data on it, and secondly identify a position of the data on the tape stored within the cartridge. In the case of single reel cartridges, the whole of the magnetic tape is wound on to the single cartridge whenever the cartridge is not in a tape drive mechanism. To find a particular item of data on a cartridge, a person must select the cartridge, put the cartridge into a conventional tape drive device, for example forming part of a host personal computer, workstation, or computerised test equipment device, and view a content of the tape on a visual display unit forming part of the host computer, workstation or test equipment device. There is a time lag incurred in winding and rewinding the tape to identify a particular item of data.

-3-

A current industry trend in tape data storage media is to supply a solid state transponder memory data storage device on or within a tape cartridge, on which can be stored information describing a data content of the tape. Examples of the type of information stored include file name and type, customer information, system data backed-up, application and file space on the magnetic tape used or  
5 remaining. The information stored on such a memory device is upgraded when the magnetic tape is accessed using a known tape drive in a host computer having an integrated driver and read-write device, controlled by software resident on the host device. Many different types of tape data storage cartridge are used  
10 in system backup and the location of the transponder memory storage device in relation to a casing of the tape cartridge varies between cartridge media types and is specific to the particular cartridge media type in each case.

To identify items of data stored on the tape cartridge, the memory device  
15 comprising part of the cartridge stores data as mentioned above, describing the file names, customer information, application and file space remaining on the tape or used on the tape, and dates of storage of files. A summary information describing the data items stored on the tape can be obtained by automatically interrogating the transponder memory storage device in the cartridge, which is  
20 read by the tape drive device by inductive coupling to a transceiver chip forming part of the memory device, and which can be displayed on the visual display unit of the host device. Reading the content of the memory device involves physically picking up the data cartridge, putting the data cartridge in the tape drive of the host device, operating a keypad or pointing device, for example a mouse or  
25 tracker ball, to select menu items from an application program on the host device, in order to identify the information describing the data content of the tape.

In order to print a label for the tape, this involves running an application stored on the host device, perhaps manually entering the information describing  
30 the data on the tape via a keyboard and/or pointing device and then printing out

-4-

the label. A problem in printing a label for the tape cartridge by this mechanism is the time taken to print each label. For example, for a person wishing to find a particular item of data in a library, the first time a person enters the library on a particular day, he may have to pick an unlabeled tape cartridge which the person  
5 thinks the data item may reside on, and in order to check the data on the cartridge needs to turn on the host computer device, wait for the host device to boot up and initialise, taking possibly a minute or two, select the application required for reading the memory device on the cartridge, again perhaps taking of the order of one or two minutes, and then read the data. If the data cartridge  
10 does not contain the required data, then the person needs to remove the cartridge from the drive, which may or may not involve a delay in the software controlling the tape drive unit allowing the person to remove the tape, and then select a different tape from the shelf. For the second, subsequent tape cartridge inspected, the time delays will be shorter than inspecting the first data cartridge,  
15 since the host device does not need to be booted up and initialised. However, there is still a significant delay in interrogating the memory device on the cartridge through the application software provided by the host device.

Having found the data cartridge containing the required data, in order to  
20 print a label for attachment to the cartridge, the person needs to call up the application software for printing the label, perhaps enter details describing the cartridge manually into the printing application software, using a keyboard and/or pointing device and before printing make sure that an attached printer device is turned on. In order to turn the printing device on, the printing device may go  
25 through a print initialisation routine, which in the case of an inkjet printer may take several minutes if used for the first time on a particular day, and providing there is sufficient print medium in the printer device, then a label can be printed. However, since many printer devices use paper as a print medium, it may be necessary to find and insert sheets of adhesive labels into the printer in order to  
30 print out an adhesive label for the tape cartridge.

-5-

Therefore, conventionally it may take anything of the order of 10 to 15 minutes to print a label for a data cartridge, including all the time delays involved in booting up a host device and initialising a printer. Additionally, this assumes  
5 that a host computer device is available at the location of the library, which it may not be, in which case an additional delay is incurred in taking the tapes to the host device for the data to be reloaded. Although the time delay taken to print a label for subsequent tape cartridges after the first will reduce per cartridge, the cataloguing and identification of data stored on existing legacy libraries of tape  
10 data storage cartridges is a time consuming process, whether the library is a manual access library, or an automated library having a robotic device for selected cartridges.

In all cases, in order to improve ease and accuracy of access to the  
15 required data, a system for checking the data stored on a tape and labeling the tape accurately will be of benefit.

#### **Summary of the Invention**

Specific methods according to the present invention, recognise that  
20 information contained on transponder memory devices in a data storage cartridge can be used to provide a rapid means of access to a data set which can be utilised to identify the cartridge and to produce a cartridge label.

Conceptually, the specific embodiments of the invention aim to provide an  
25 integrated printer with built-in radio frequency capability to read information stored on a memory device integrated into a data storage medium cartridge casing which automatically prints the information read from the memory device in a pre-formatted user-readable form on a label suited to the specific cartridge casing type.

30

-6-

According to first aspect of the present invention there is provided a hand holdable portable reader device capable of reading data describing a cartridge-type data storage device said reader device comprising:

5        a signal receiver means capable of receiving data signals emitted from said data storage device;

         a memory means capable of storing said data signals received by said receiver means;

10

         a printer device configured to print said data received from said receiver means onto a print media; and

         a processor device operable to control said printer to print said data on said  
15       print media.

         Preferably said printer is configured for printing a label of a size and shape suitable for direct attachment to a said data storage cartridge.

20       Preferably said processor is configured to select a predetermined selection of information items describing said data storage device from said data received from said data storage device, and to control said printer to print said predetermined set of information items onto a said print media in a predetermined format.

25

         The device may further comprise a keypad control means, said keypad control means being finger operable for inputting user commands to said processor, for controlling said display device for scanning through data items describing said data storage device, said data items retrieved from said memory  
30       means.

-7-

The device may further comprise a keypad control means configured for operating such that upon a user activating a key of said keypad control means, said printer device operates to print a predetermined selection of data items  
5 describing said data storage device, on to said print media.

Preferably said processor device is operable under control of a dedicated operating system stored in a read only memory device.

10 The reader device may further comprise an interface means for interfacing with an external processor.

The reader device may further comprise a display means, and said processor operates under control of said operating system and a keypad data  
15 entry means to display a selection of user selectable menu items on said display means.

The reader device may have a keypad device comprising a print key wherein said processor operates to receive a print signal produced by activation  
20 of said print key, and sends a print signal to said printer for printing data items input via said receiver.

Preferably said reader device comprises a port adapted to locate said data storage device and said receiver means is located within said port such that  
25 when a said data storage device is inserted into said port, a memory device of said data storage device lies in close physical proximity to said receiver means.

The reader device may further comprise a housing for accepting a roll of blank labels.

30

-8-

Preferably, the reader device comprises a port adapted to locate said data storage device, said port comprising a recess specifically shaped and formed to accept said tape data storage device.

5        Said reader device may comprise a port adapted to locate said data storage device, said port comprising a surface against which said data storage device may be offered in close proximity to said surface, such that a receiver device may detect signals transmitted by said data storage device.

10       The invention includes a hand-holdable portable reader device for reading data from a memory device contained on a data storage device, said reader device comprising:

15       a casing having a port capable of accepting a said data storage device;

      reading means for reading data from said memory device of said data storage device, said reading means located in said port;

20       processor means configured for controlling said reading means and for accepting data signals received by said reading means;

      memory means containing an operating system for controlling said processor means by a sequence of command signals;

25       display means for displaying said data obtained from said receiving means in a user readable format;

      keypad data entry means capable of receiving input commands for activation of said menu items; and

30

-9-

printer means operable under control of said processor means for printing a label in response to a user command signal input activated by said keypad data entry means.

5        **Brief Description of the Drawings**

For a better understanding of the invention and to show how the same may be carried into effect, there will now be described by way of example only, specific embodiments, methods and processes according to the present invention with reference to the accompanying drawings in which:

10

Fig. 1 illustrates schematically a tape data storage cartridge having an embedded read/write memory accessible by means of a transponder unit within the cartridge, as is known in the prior art;

15

Fig. 2 illustrates schematically a first data storage media reader and printer device according to a first specific embodiment of the present invention, comprising a casing, a port to insert a data storage cartridge for accessing information contained on a memory device on the cartridge, a display screen, a printer and keypad allowing data to be selected by a user;

20

Fig. 3 illustrates schematically internal electronic components of the data storage media reader and printer device of Fig. 2, illustrating interaction with a transponder device on a tape data storage cartridge;

25

Fig. 4 illustrates schematically a command sequence for reading data from a memory device on a tape data storage cartridge, writing it to a memory area of the reader-printer device, and displaying and printing all or a selected set of the data;

-10-

Figs. 5A to 5G illustrates schematically displays of predetermined selected data items read from the data storage cartridge, and which appear on the display screen of the first reader-printer device; and

- 5        Fig. 6 illustrates schematically an example of a layout of a label printed by the first reader-printer device of Fig. 2.

#### **Detailed Description of the Best Mode for Carrying Out the Invention**

There will now be described by way of example the best mode  
10 contemplated by the inventors for carrying out the invention. In the following description numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be apparent however, to one skilled in the art, that the present invention may be practised without limitation to these specific details. In other instances, well known methods and structures  
15 have not been described in detail so as not to unnecessarily obscure the present invention.

In order to remove errors in cartridge labeling and to improve the speed of labeling, a media-dependent labeling system is envisaged which is specific to a  
20 particular type or design of data storage media device. This uses information contained on a memory device located in the data storage cartridge (the media) to produce a printed cartridge label, where the label attributes can be selected by the user. This system enables cartridge data to be assessed and the cartridge to be labelled without having to access the data stored on the magnetic tape and  
25 hence avoiding the use of a tape driver of a host device. As a result, the information concerning data contained in the cartridge can be assessed rapidly. By integrating a means of reading the information contained on the cartridge memory device with a means of printing this information either directly to a pre-labelled cartridge or to a blank label all within one device, cartridge labels may be  
30 updated accurately and rapidly.

-11-

Labeling of a data storage device need not occur at a time when data is recorded on the data storage medium, but labeling can occur retrospectively, and away from a host device having a tape drive mechanism.

5

Additionally, the device may support multiple language sets and fonts for versatility in user readout. This will allow for versatility and accuracy in user access to cartridge data.

10

Specific methods according to the present invention described herein are concerned with the reading of data from solid state memory devices located on data storage devices and writing this data to a memory area and the selection of data from this memory area for display and printing. A media reader and printer device may be used as an independent hand held and portable device.

15

Referring to Fig. 1 herein, there is illustrated schematically a conventional prior art tape data storage cartridge device comprising a cartridge casing 100, containing one or a pair of reels on which is wound an elongate band of magnetic tape, comprising a high capacity data storage medium on which data may be recorded from a host device such as a computer server device, a personal computer, a workstation, or a computer controlled test instrument. The cartridge contains a solid state programmable memory device 101 within the cartridge casing 100, the memory device comprising a transponder unit, and a read/write memory, which can be written to or read via the transponder unit, which can be inductively powered by an RF signal generated by a transmitter placed immediately adjacent the cartridge casing, as is known in the art. The height, width, and length dimensions of the cartridge casing 100 and the general layout of the casing, including the positioning of the memory device 101 within the casing, are specific to the particular type and design of tape data storage cartridge. That is to say the layout of the cartridge is media specific.

30

-12-

Information about the cartridge and the data stored on the cartridge can be stored in the memory device 101. The data stored may include data describing file names of data on the tape, data describing customer information, data  
5 describing an application stored on the tape, data describing an amount of unused memory space remaining on the tape, and dates upon which files were stored.

Referring to Fig. 2 herein there is illustrated a first media reader and labeling  
10 device 200, according to a first specific embodiment of the present invention. The first reader and labeling device comprises a casing 201 of a size, shape and weight which is easily portable by a person, for example of a size and shape which can easily fit into a persons palm, being hand-held, the casing having means 202 for receiving a tape data storage cartridge in the form of a port  
15 arranged to locate a cartridge; an electrically powered printer device 203 capable of producing printed labels from a roll of self-adhesive labels 204; a display device, preferably a liquid crystal display 205; a user input interface 206 having a finger operable keypad; a battery power supply; a receiver device for communicating with a memory storage device on a tape data storage cartridge,  
20 the receiver device being located in or near the cartridge port; and an external port 207 for connecting to an external computer device or processor.

The port for receiving the tape data storage cartridge may comprise a hinged lid having a pair of receiving guides into which the tape data storage  
25 cartridge is slotted, such that when the lid is closed the cartridge is positioned within the casing such that the memory storage device of the cartridge is immediately adjacent the receiver device mounted in the casing, the arrangement being that the receiver device of the reader device is in close physical proximity with the transponder memory storage device of the tape cartridge such that

-13-

inductive coupling can occur between the receiver and memory storage device, allowing reading of data from the memory storage device by the receiver.

5 The cartridge receiving port 202 is designed to accept a particular type of data storage cartridge, and may be specific to a particular type of data cartridge product. Port 202 is designed such that when the tape data cartridge is accepted into the port, the memory storage device on the tape data cartridge aligns automatically with an aerial and receiver of the reader device within casing 201.

10 The means for receiving the cartridge preferably operates to secure and hold the cartridge in a position such that the memory storage device on the cartridge is immediately adjacent and opposite the receiver of the reader and labeling device. The port 202 is preferably keyed such that the tape data storage cartridge can only be inserted in one orientation, and to avoid enabling other  
15 types of tape data storage cartridge being inserted into the port.

In a variation of the first embodiment, the port means capable of receiving the tape data storage cartridge may comprise a recess specifically shaped and formed to accept the tape data storage cartridge, or a spring loaded slot  
20 mechanism into which the tape data storage cartridge is inserted.

In a second embodiment, the port may comprise a surface, against which a data storage cartridge is offered, in close proximity to the surface, but not necessarily contacting the surface, such that the receiver device can detect  
25 signals transmitted by the transponder within the cartridge across an air-gap of the order of 20mm or less between receiver and transponder. In this version, it is not necessary that the tape data storage cartridge touches any part of the reader and labeling device in order for data transfer to occur.

-14-

Printer 203 contains an easily removable cover portion which accesses a housing for containing the roll of labels. The housing and its cover are designed such that the cover can be easily and quickly removed manually without the need for special tools, and expired roll of labels be easily removed, and a new roll of labels be easily inserted, whereby the roll of labels are automatically aligned with a print-head of the printer on entering the roll of labels into the label housing. Printer device 203 prints out a label 204 of dimension and shape which is specific to the particular data cartridge type and which is large enough to print out predetermined information concerning the tape data cartridge in a layout and form which fits on the label which can be easily adhered to the tape data cartridge.

Keypad 206 comprises an up scroll finger-operable button for scrolling a selection of memory items displayed on display device 205 in an upward direction; a down scroll button for scrolling the memory items in a downward direction; and a print button.

Referring to Fig. 3 herein, there is further illustrated schematically components of the first reader and labeling device, configured for reading, displaying and printing data onto a label from a transponder 300 having a read/write memory 301 and an aerial 302 in a tape data storage cartridge.

The reading and labeling device comprises an aerial 303, a receiver 304, a processor 305, a programmable memory area 306, a control interface 307, a display 308, a Read Only Memory (ROM) 309 containing an operating system, a keypad 310 for entering instructions from a user, and a printer device 311. Interface 307 is capable of unloading to or down from an external device 312 having a processor.

-15-

The processor 305 has a relatively small amount of separate memory 306 of the order of 1 MByte or less, and is limited practically by the smallest size of memory chip commercially available. Alternatively, the processor 305 may be constructed integrally with memory area 306 on a same chip, for example a known Power PC® chip. In the best mode, to achieve compact size and ease of manufacture, the components are as integrated as possible with the processor, and preferably include a built-in operating system in read only memory ROM 309, on a same chip as processor 305.

10 The aerial 303 and receiver 304 are used to receive data from the memory device 300 of the cartridge, which uses an electrically erasable programmable read only memory (EEPROM) as read/write memory area 301. With the data storage cartridge inserted in the reader device, the aerial 302, of the memory device, forms a contact less interface with the aerial 303 of the reader device using an inductive coupling scheme using a magnetic field to transmit data to the receiver 304. In the best mode, the protocol used to transmit information by the inductive coupling scheme is known as the MIFARE ® system developed by Phillips/Mikron of the type presently employed in "Smart" credit card technology for use in personal banking applications and which is known in the art.

15 Advantages and features of this system as used by the first embodiment include a high reliability; operating frequency 13.56 MHz; and an anti-collision protocol, which provides an ability to handle several transponders in close proximity without interference.

25 Aerial 303 of the identification and labeling device is positioned such that when a tape cartridge having a cartridge aerial 302 is positioned in the cartridge receiving means 202 of the reader device, the two aerials are positioned a distance less than or equal to 20 mm from each other, so that inductive coupling can occur between the two aerials. Over such a range this yields coupling factors between aerials of the order 1 to 10% and transmission speeds of the order 100

30

-16-

Kbps between the aerals. Receiver 305 of the identification and labeling device transmits an inductive signal which is received by the transponder 301 of the tape cartridge, and which powers the transponder memory storage device in the tape cartridge, such that the transponder is able to emit signals describing the content  
5 of the memory storage area 301 across an air gap between the two aerals, which is received by receiver 303. Alternatively, transmission of data signals between the memory device and the reader-labeling device may be within the infra-red range of frequencies.

10 Data read from the memory device 300 in this manner is written via the processor 305 to programmable random access memory, RAM 306, where a copy of all read data is maintained. Data stored in the RAM 306 is displayed on the display screen 308 or is accessed via external processor 312 using the control interface 307.

15 Referring to Fig. 4 herein, there is illustrated schematically a process for operating the reader and labeling device implemented as a set of command sequences performed by the processor 305 to write data received from the cartridge transponder to internal memory 306, and to display the data on the  
20 display device 308. The command sequences provide for selecting a required data set and printing a label.

The first reader and labeling device may operate in two basic modes of operation. In the first mode of operation, a tape data storage cartridge is input  
25 into port 202, and LCD display device 205 and keypad 206 are used to read information stored on the memory storage device describing a content, and characteristics of the tape cartridge itself, and of data stored on the tape cartridge.

-17-

In a second mode of operation, a predetermined set of data stored on the memory of the tape data storage cartridge is printed onto a label 204. The first and second modes of operation may be operated independently of each other. That is to say, it is possible to read the information stored on the memory device  
5 on the cartridge without printing out any of that information, and it is possible to print the predetermined set of information on a label without requiring use of the LCD display device 205 or scrolled menu which appears on the device.

A first mode of operation will now be described. A user places a tape data  
10 cartridge into the receiving port 202 of the first reader and labeling device, thereby locating the cartridge firmly in the casing 201 of the device in a position where the transponder memory device 300 of the cartridge lies in close physical proximity to aerial 303 and receiver 304 of the reader and labeling device. Processor 305 under control of operating system stored in ROM 309 operates in  
15 an initial state 400, from which the cartridge port is periodically polled in step 401. All transponders 300 within the operating range return a 10 byte alpha-numeric serial number. If no memory device is detected in the port in step 402, the cartridge port is presumed empty, and the processor idles through the initial state, and continues to poll the cartridge port in step 401. The cartridge slot is  
20 presumed empty if no serial number is returned. Consequently an external detector device incorporated in the cartridge port of the reader device may be polled in step 403 to check whether a cartridge is inserted into the port 202. If no cartridge is detected, the processor returns to initial state 400, continuously polling the cartridge slot in step 401 and/or polling the detector in step 403. If a  
25 memory device is detected in steps 403 or 401, the processor enters a memory device detected state 404 from which the processor reads data received by receiver 304 via aerial 303. Receiver 304 continuously transmits a power signal to the transponder 300 in the tape cartridge in order to allow the transponder to transmit signals through aerial 302 containing data concerning the information  
30 stored on the read/write memory device 301. Transmission of the power signal

-18-

across the air gap by aerial 303 may be dependent upon the sensor within the reader and labeling device casing being activated by insertion of a tape data storage cartridge. When no cartridge is inserted into the port, the RF power signal may be interrupted, so as to conserve power in the battery.

5

In step 406, data read from the memory device through receiver 304 is directed by the processor 305 into random access memory 306. Data can be selected from the random access memory in step 407 for display on display device 308 in step 408. Display of data from the RAM is accessed through operation of a menu system in step 409. Initially, predetermined data, for example a serial number of the cartridge which has been read from the memory device may be displayed on the display device 308. Referring to Fig. 5A herein, there is illustrated schematically an example of information displayed on display device 205, comprising a serial number of a tape cartridge. Upper and lower scroll icons 500, 501 may appear on display 205, giving a visual indication to the operator that to access further items of data, the upper and lower scroll buttons of the keypad 206 need to be activated. In step 410 a user may enter keypad entries, for example pressing a scroll button which scrolls through display items as illustrated in Figs. 5B to 5G herein under control of the operating system stored in ROM 309, in menu system 409. The operating system stored in ROM 309 is specifically configured from a knowledge of the format and layout of the information items stored as data in the memory device of the cartridge. By scrolling through the menu, by operating the keypad scroll buttons, display of the serial number of the tape, the date the tape was last used, an amount of memory remaining on the tape, names of back up sessions stored on the tape e.g. "Full Backup Monday 3/8/98", a number of times the tape has been used, a number of errors on the tape and an option to print a label containing a predetermined set of information items describing data stored on the tape may be accessed. If, in response to a 'print label' display as illustrated in Fig 5G, a key on keypad 206 is pressed, then in step 409, processor 305 sends a signal to printer 311, along with

10

15

20

25

30

-19-

signals describing the information to be printed on the label, which activates printer 311 to print a label 204 in a format suitable for direct attachment to the tape data cartridge. The user may then release the port cover and remove the cartridge, detach the label 204 from its backing paper and stick the label on the  
5 cartridge. The label characteristics may be determined by user input via the menu system 409. Characteristics include a chosen language set, font size and type, and in this way allow the user to customise the label as necessary.

In a second mode of operation, where it is not required to identify or  
10 interrogate information contained on a memory of the tape cartridge, but just to simply print a label to stick on the tape data cartridge, steps 400-406 as described above are repeated. The user places the tape cartridge in the port 202, closes the cover, and the processor interrogates the memory device on the cartridge and stores data received from the memory device in random access  
15 memory 306 as described herein above. However, in the second mode of operation the user activates a print key on key pad 206 in step 410 which activates direct printing of a predetermined set of information items received from the memory device 300. An example of a printed label is illustrated in Fig. 6 herein. The predetermined set of information items may be selected from the set:  
20 a serial number of the tape; a date the tape was last used; an amount of memory space remaining on the tape; a file name of a first file on the tape; a file name of the last file on the tape, a name of a back up session stored on the tape. This list of predetermined selected information items is exemplary, and not exhaustive, and the exact information items which are printed on the label depend upon the  
25 exact information items which are stored on the memory on the cartridge tape, which are specific to the particular media format of the tape cartridge and reader-labeling device, as will be understood by those skilled in the art. Activation of the print key causes automatic printing of the label containing the predetermined information items. The user then releases the cartridge from the port 202, sticks  
30 the label on the cartridge and may return the cartridge back to the shelf. An

-20-

advantage of the second mode of operation is speed of labeling of cartridges. For example, where hundreds or thousands of tape cartridges are stored in a library, the handheld reader-labeling device may be used to efficiently and quickly label a large number of tape cartridges manually with a pre-selected set of  
5 information describing the tape cartridge and its contents.

-21-

**Claims:**

1. A hand holdable portable reader device capable of reading data describing a cartridge-type data storage device said reader device comprising:

5 a signal receiver means capable of receiving data signals emitted from said data storage device;

a memory means capable of storing said data signals received by said receiver means;

10

a printer device configured to print said data received from said receiver means onto a print media; and

15 a processor device operable to control said printer to print said data on said print media.

2. The reader device as claimed in claim 1, wherein said printer is configured for printing a label of a size and shape suitable for direct attachment to a said data storage cartridge.

20

3. The reader device as claimed in claim 1, wherein said processor is configured to select a predetermined selection of information items describing said data storage device from said data received from said data storage device, and to control said printer to print said predetermined set of information items  
25 onto a said print media in a predetermined format.

4. The reader device as claimed in claim 1, further comprising a keypad control means, said keypad control means being finger operable for inputting user commands to said processor, for controlling said display device for

-22-

scanning through data items describing said data storage device, said data items retrieved from said memory means.

5           5.       The reader device as claimed in claim 1, further comprising a keypad control means configured for operating such that upon a user activating a key of said keypad control means, said printer device operates to print a predetermined selection of data items describing said data storage device, on to said print media.

10           6.       The reader device as claimed in claim 1, wherein said processor device is operable under control of a dedicated operating system stored in a read only memory device.

15           7.       The reader device as claimed in claim 1, further comprising an interface means for interfacing with an external processor.

20           8.       The reader device as claimed in claim 1, wherein said reader device comprises a display means, and said processor operates under control of said operating system and a keypad data entry means to display a selection of user selectable menu items on said display means.

25           9.       The reader device as claimed in claim 1, having a keypad device comprising a print key wherein said processor operates to receive a print signal produced by activation of said print key, and sends a print signal to said printer for printing data items input via said receiver.

10           10.      The reader device as claimed in claim 1, further comprising a port adapted to locate said data storage device and said receiver means is located within said port such that when a said data storage device is inserted into said

-23-

port, a memory device of said data storage device lies in close physical proximity to said receiver means.

11. The reader device as claimed in claim 1, further comprising a  
5 housing for accepting a roll of blank labels.

12. The reader device as claimed in claim 1, further comprising a port adapted to locate said cartridge type data storage device, said port comprising a recess specifically shaped and formed to accept said tape data storage device.  
10

13. The reader device as claimed in claim 1, further comprising a port adapted to locate said cartridge type data storage device, said port comprising a surface against which said data storage device may be offered in close proximity to said surface, such that a receiver device may detect signals transmitted by  
15 said data storage device.

14. A hand-holdable portable reader device for reading data from a memory device contained on a data storage device, said reader device comprising:  
20

a casing having a port capable of accepting a said data storage device;

reading means for reading data from said memory device of said data storage device, said reading means located in said port;  
25

processor means configured for controlling said reading means and for accepting data signals received by said reading means;

memory means containing an operating system for controlling said  
30 processor means by a sequence of command signals;

-24-

display means for displaying said data obtained from said receiving means in a user readable format;

- 5        keypad data entry means capable of receiving input commands for activation of said menu items; and

printer means operable under control of said processor means for printing a label in response to a user command signal input activated by said keypad data  
10    entry means.

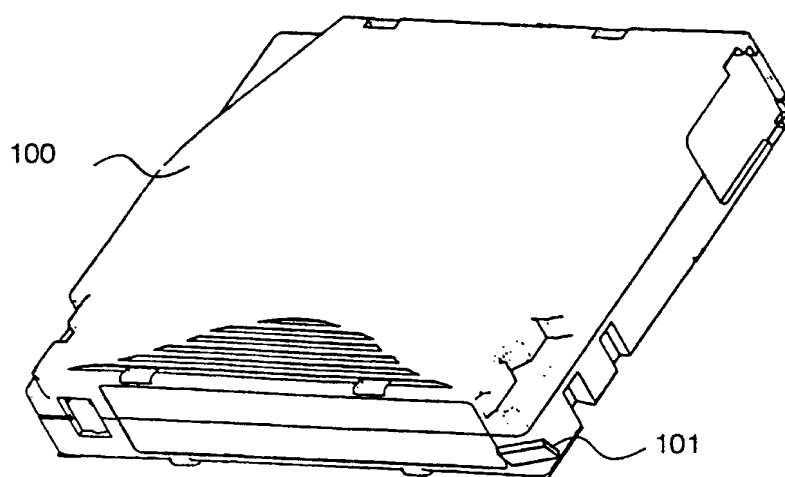


Fig. 1  
(Prior Art)

2/7

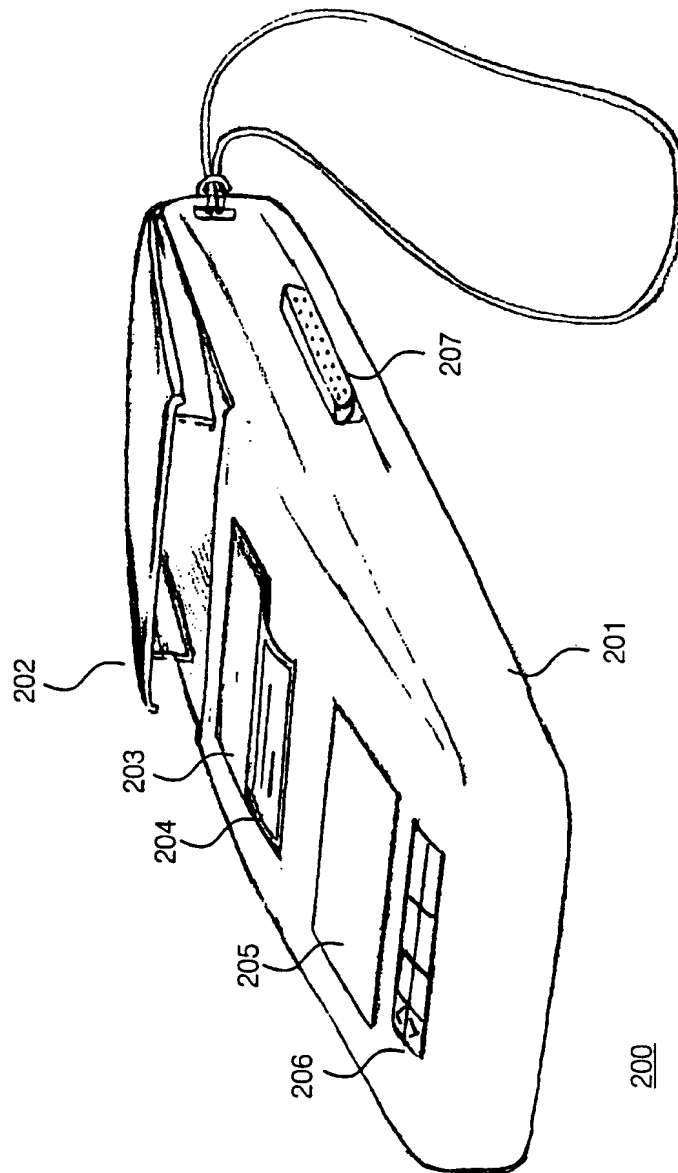


Fig. 2

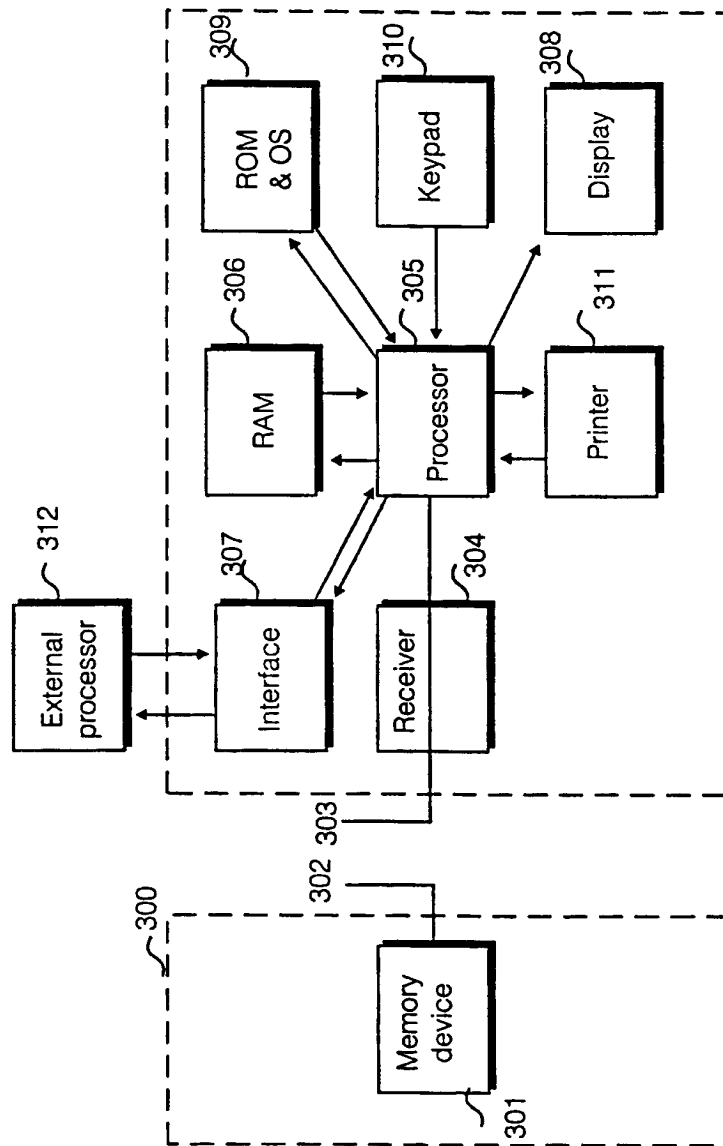


Fig. 3

4/7

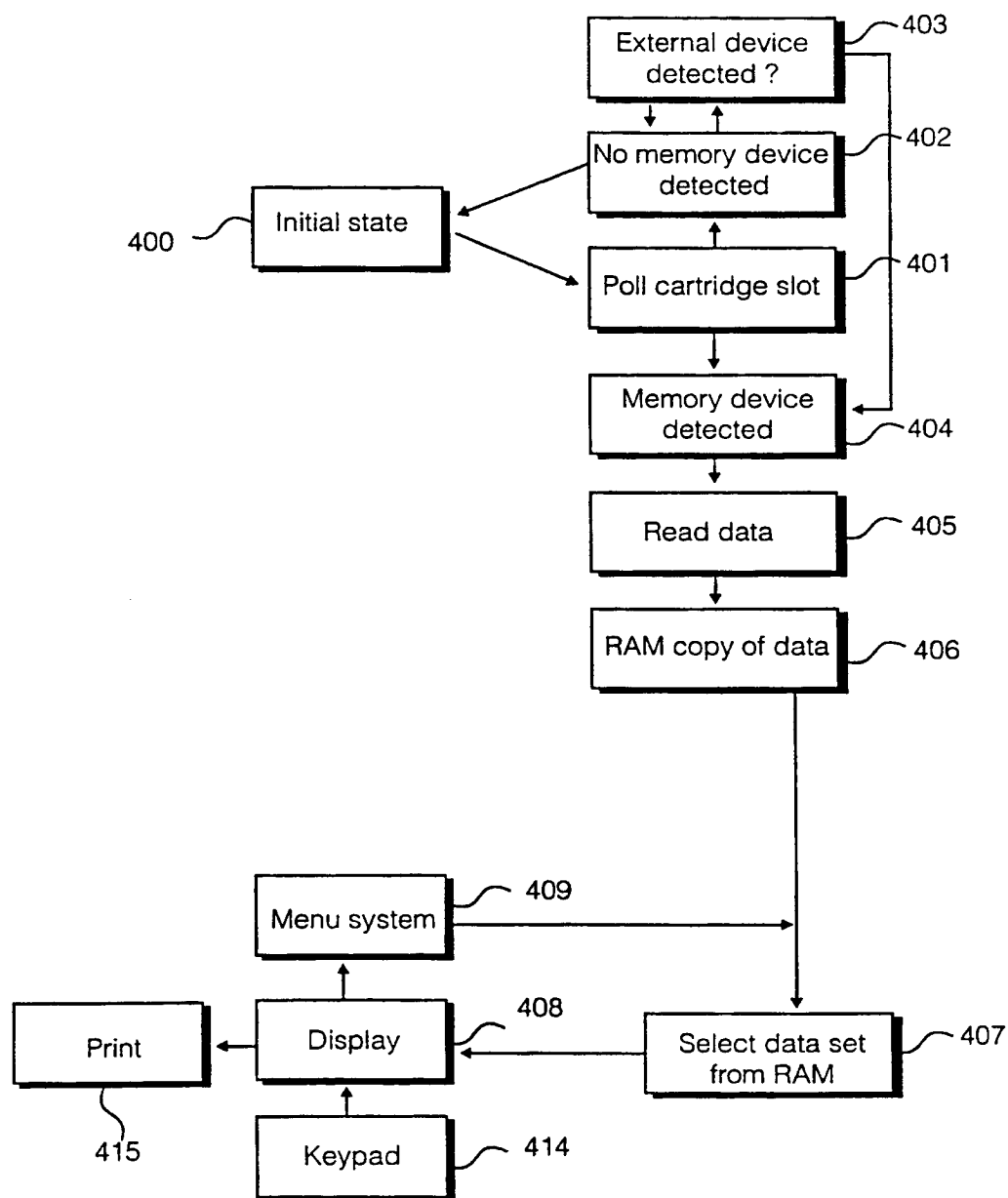


Fig. 4

5/7

500  
SERIAL NO:  
2851035268  
501

Fig. 5A

DATE LAST USED  
05 SEP 97

Fig. 5B

REMAINING  
445MB

Fig. 5C

BACKUP SESSION:  
C:/RECORDS/BACKUP.010881

Fig. 5D

TAPE USED:  
7 TIMES

Fig. 5E

ERRORS THIS TAPE: 0

Fig. 5F

6/7

PRINTED LABEL?	▲
1. YES      2. NO	▼

Fig. 5G

07. 937027

7/7

Serial No: 2851035268 1st file: C:/Records.Backup.0108B1  
Date Last Used: 05 Sep 97 Last file: C:/Records.Backup.0408B1  
Space Remaining: 445MB

Fig. 6

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>30980107 W01</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/GB 00/ 00676</b>	International filing date (day/month/year) <b>25/02/2000</b>	(Earliest) Priority Date (day/month/year) <b>24/03/1999</b>
Applicant <b>HEWLETT-PACKARD COMPANY et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

### 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

### 4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

### 5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

### 6. The figure of the **drawings** to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

2



None of the figures.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 00/00676

## Box III TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

The Abstract is changed as follows:

line 1: after 'reader' insert '(200)';  
line 5: after 'printer' insert '(203)';  
line 5: after 'display' insert '(205)';  
line 5: after 'keypad' insert '(206)'.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/00676

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06K17/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G06K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 455 409 A (BOWER JR ROBERT ET AL) 3 October 1995 (1995-10-03) column 1, line 53-65; claim 48; figures 1, 8A-8D, 15, 16 column 5, line 56 -column 6, line 9 column 8, line 13 -column 10, line 2 column 25, line 40 -column 26, line 67 ---	1-14
Y	US 5 592 596 A (BALSOM JAMES) 7 January 1997 (1997-01-07) column 1, line 18-28 column 2, line 14-37 column 4, line 32 -column 5, line 17 column 7, line 32-59; claims 3, 4, 6 ---	1-13
Y	US 4 141 045 A (SHEEHAN DANIEL L) 20 February 1979 (1979-02-20) column 6, line 57-67 ---	14
A	---	11
	--- -/--	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&amp;" document member of the same patent family

Date of the actual completion of the international search

11 April 2000

Date of mailing of the international search report

18/04/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Cardigos dos Reis, F

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/00676

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>US 5 765 954 A (NUNOKAWA MASAHIKO ET AL)  16 June 1998 (1998-06-16)  column 3, line 42 -column 4, line 27;  figure 1  column 6, line 39-65  column 17, line 24 -column 18, line 6  -----</p>	9

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/00676

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5455409 A	03-10-1995	CA 2224168 A WO 9700496 A	03-01-1997 03-01-1997
US 5592596 A	07-01-1997	NONE	
US 4141045 A	20-02-1979	AU 520834 B AU 3331778 A BE 863948 A BR 7800920 A CA 1070010 A DE 2806184 A FR 2381372 A GB 1581966 A IT 1203169 B JP 53121604 A NL 7801726 A	04-03-1982 23-08-1979 14-08-1978 10-10-1978 15-01-1980 31-08-1978 15-09-1978 31-12-1980 15-02-1989 24-10-1978 22-08-1978
US 5765954 A	16-06-1998	JP 6115222 A JP 2893499 B JP 6122245 A JP 6143766 A JP 6238997 A US 5605404 A US 5961225 A US 5934812 A US 6012860 A CA 2107746 A CN 1087583 A EP 0592198 A US 5492420 A US 5997194 A US 5599119 A US 5634728 A US 5752777 A US 5967678 A US 5887993 A	26-04-1994 24-05-1999 06-05-1994 24-05-1994 30-08-1994 25-02-1997 05-10-1999 10-08-1999 11-01-2000 07-04-1994 08-06-1994 13-04-1994 20-02-1996 07-12-1999 04-02-1997 03-06-1997 19-05-1998 19-10-1999 30-03-1999

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE  
 in its capacity as elected Office

<b>Date of mailing</b> (day/month/year) 11 December 2000 (11.12.00)	
<b>International application No.</b> PCT/GB00/00676	<b>Applicant's or agent's file reference</b> GB0000698WO1
<b>International filing date</b> (day/month/year) 25 February 2000 (25.02.00)	<b>Priority date</b> (day/month/year) 24 March 1999 (24.03.99)
<b>Applicant</b> GOLD, Stephen et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
 24 October 2000 (24.10.00)

☐ in a notice effecting later election filed with the International Bureau on:  
 \_\_\_\_\_

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	Authorized officer  Pascal Piriou  Telephone No.: (41-22) 338.83.38
---	---

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

RECEIVED  
18 MAY 2001

PCT

To:

LAWMAN, Matthew John Mitchell  
HEWLETT- PACKARD Limited  
Intellectual Property Section  
Filton Road  
Stoke Gifford  
Bristol BS34 8QZ  
GRANDE BRETAGNE

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT  
(PCT Rule 71.1)

Date of mailing  
(day/month/year) 16.05.2001

Applicant's or agent's file reference  
30980107 WO1

**IMPORTANT NOTIFICATION**

International application No.  
PCT/GB00/00676

International filing date (day/month/year)  
25/02/2000

Priority date (day/month/year)  
24/03/1999

Applicant  
HEWLETT-PACKARD COMPANY et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

**4. REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized officer

Slater, S

Tel. +49 89 2399-2565



# PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 30980107 WO1	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB00/00676	International filing date (day/month/year) 25/02/2000	Priority date (day/month/year) 24/03/1999
International Patent Classification (IPC) or national classification and IPC G06K17/00		
Applicant HEWLETT-PACKARD COMPANY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.  
  
☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
  
 These annexes consist of a total of 24 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  24/10/2000	Date of completion of this report  16.05.2001
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Grob, M  Telephone No. +49 89 2399 2620  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB00/00676

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, pages:**

1-20 as received on 08/03/2001 with letter of 07/03/2001

**Claims, No.:**

1-14 as received on 08/03/2001 with letter of 07/03/2001

**Drawings, sheets:**

1/7-7/7 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB00/00676

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes:	Claims	1-14
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-14
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-14
	No:	Claims	

2. Citations and explanations  
**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1 = US-A-5 455 409

D2 = US-A-5 592 596

D3 = US-A-4 141 045

2. D1 discloses an apparatus for monitoring a library of magnetic tape cartridges 10. Each cartridge 10 (cf Fig 1) comprises a casing holding a reel of magnetic tape. In addition, a non-volatile memory device 18 is mounted on the front edge 14 of the cartridge 10 (cf col 8, lines 37-48) for storing a "volser" number (volume serial number) and history of tape usage. The cartridges 10 are stored in a number of tape carriers (racks) 12 (cf Fig 2). As shown in Fig 6, the tape carriers 12 are connected to a host computer 52 for monitoring the library of cartridges. The non-volatile memory devices 18 are programmed using a memory programmer unit 20 (cf Figs 8A-D) connected to the host computer 52 (cf col 10, line 50 et seq.). The "volser number is: a) keyed into the host computer 52 (cf Fig 8A and col 10, lines 60-67), b) entered into the host computer 52 via a bar code scanner which reads a bar code label on the cartridge 10 (cf Fig 8B and col 13, line 58 et seq.), or iii) read from the initial portion of the tape itself (cf Fig 8C and Fig 8D, cf col 14, line 18 et seq.). The "volser" number is then communicated to the programmer unit 20 and written into the non-volatile memory device 18 of the cartridge 10. When the host computer 52 receives a cartridge request containing the "volser" number, this information is transmitted to polling circuitry (cf Fig 13) in the respective tape carriers (racks) 12 to determine whether the selected cartridge is present within a receptacle of the carriers 12. The position of each carrier (rack) 12 in the monitoring system is stored in the memory of the microcontroller 300 (cf Fig 13 and col 25, line 5 et seq.) which forms a part of the circuit in the carrier (rack) 12. In order to program the carrier (rack) position into the EEPROM of the microcontroller 300, a portable position programmer 500 may be used (cf Fig 15, cf col 25, line 20 et seq.).

- 2.1 Although D1 discloses (cf col 8, lines 21-24) that "volser" numbers are printed on labels attached to the tape cartridges, D1 does not disclose a **hand-holdable portable reader** device for receiving/reading data from the data storage device and **printing** at least some of this data on print media. Hence, the devices of claims 1 and 14 are new with regard to D1.
- 2.2 Furthermore, in connection with the hand-holdable portable programmer 500 of D1, it is noted that this programmer programs the EEPROMs of the microcontrollers 300 of the carriers (racks) 12, not the EEPROMs 18 of the cartridges 10. In addition, the programmer 500 does not have a printer device! Hence, the devices of claims 1 and 14 are not obvious with respect to D1.
3. D2 discloses (cf Fig 1) a jukebox 40 for storing optical disks or magnetic cassette cartridges (cf col 1, lines 18-27). Under certain conditions, the jukebox of D2 triggers the printing of a label including the media ID associated with the selected optical disk cartridge (magnetic cassette cartridge). The printer can be integrated within the jukebox (cf col 4, line 45 et seq.). The printing of the label is triggered if a) a controller of the optical disk cartridge storage and retrieval device (jukebox) determines that a label flag is not associated with a selected one of a first number of optical disk cartridges, or b) a flag bit is set etc. (cf col 4, line 31 et seq.).
- 3.1 However, the optical disk cartridge storage and retrieval device of D2 is not a **hand-holdable portable** device. Hence, claims 1 and 14 are new with regard to D2. Moreover, it would not be obvious to make the device of D2 hand-holdable and portable, since the size of the device is defined (among other things) by a significant number of optical disks/magnetic cartridges stored in the jukebox.
4. D3 discloses a tape recording system which includes a label printer for printing a label for each recorded tape. The system is not hand-holdable and portable. Moreover, data stored on the tape is not received/read and then printed on the labels.
5. It follows from the above paragraphs that the subject-matter of each of the independent claims 1 and 14 (as well as the dependent claims 2-13) is new and inventive and therefore the requirements of Articles 33(2)-33(4) PCT are met.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

---

International application No. PCT/GB00/00676

**Re Item VII**

**Certain defects in the international application**

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D3 is not mentioned in the description, nor are these documents identified therein.
- 1.1 The description (cf line 14 on page 5; line 7 on page 9) gives the misleading impression that the invention relates to some sort of method. However, the present claims merely refer to a hand-holdable portable reading device. Hence, the description is not in conformity with claims as required by Rule 5.1(a)(iii) PCT.

## INTELLIGENT MEDIA READER AND LABEL PRINTER

### Field of the Invention

The present invention relates to a hand holdable portable reader device.

5

### Background to the Invention

In order to store digital electronic data, such as back-up data from a server computer device, it is known to use magnetic tape data storage cartridges comprising one or a pair of rotatable reels, and an elongate band of magnetic tape. A main reason for using such tape data storage cartridges is to make back up copies of important data. Customers running large computer installations, or research and development facilities having significant amounts of data generated may have hundreds or thousands of tape data storage cartridges containing back up data, backed up from a wide range of different host devices such as servers and computer devices. Large collections of tape data storage cartridges tend to be stored in centralised library locations, sometimes situated in fire proof safes or fire proof rooms. The library storage facility may be geographically remote from the host server devices, so that if there is destruction of data on the host devices, for example by a fire, the back up data remains safe. When a host device fails and data is lost, it is necessary to quickly locate the tape cartridge having the latest back up data, which may be located in an offsite library.

These libraries include manual access libraries, where the cartridges are simply stored on shelves or in racks or boxes, with access to the cartridges being by manually picking up the cartridges, or automated libraries, where the cartridges are stored in predefined locations on a rack or shelf and are automatically accessed. In a manual access library, to identify a content of a tape cartridge a person may simply write out a label manually, describing the content of the data on the tape cartridge. This process is tedious and prone to

P541.Amended spec.0302

error. For example the wrong label might be put on the wrong tape, so that the contents of the label do not coincide with the data of the tape cartridge. Alternatively, tape cartridges have barcodes printed on their external cases, so conventionally finding a particular tape may involve using a barcode scanner to scan a plurality of barcode labels on a plurality of tape cartridges. In the case of an automated library, robotic arms which are software controlled, deposit and collect cartridges in a rack, or shelf, and use a serial number of a tape data storage cartridge to determine a location within the library shelf or rack on which to store the cartridge. The rack or shelf is accessible by the robotic arm which may physically select a required tape on receipt of user instructions, the robotic arm being moved under computer control to a cartridge storage location on the rack or shelf.

Conventionally, a person wishing to find an item of stored data on a cartridge will need firstly to identify the correct cartridge with the data on it, and secondly identify a position of the data on the tape stored within the cartridge. In the case of single reel cartridges, the whole of the magnetic tape is wound on to the single cartridge whenever the cartridge is not in a tape drive mechanism. To find a particular item of data on a cartridge, a person must select the cartridge, put the cartridge into a conventional tape drive device, for example forming part of a host personal computer, workstation, or computerised test equipment device, and view a content of the tape on a visual display unit forming part of the host computer, workstation or test equipment device. There is a time lag incurred in winding and rewinding the tape to identify a particular item of data.

A current industry trend in tape data storage media is to supply a solid state transponder memory data storage device on or within a tape cartridge, on which can be stored information describing a data content of the tape. Examples of the type of information stored include file name and type, customer information, system data backed-up, application and file space on the magnetic tape used or

remaining. The information stored on such a memory device is upgraded when the magnetic tape is accessed using a known tape drive in a host computer having an integrated driver and read-write device, controlled by software resident on the host device. Many different types of tape data storage cartridge are used  
5 in system backup and the location of the transponder memory storage device in relation to a casing of the tape cartridge varies between cartridge media types and is specific to the particular cartridge media type in each case.

To identify items of data stored on the tape cartridge, the memory device  
10 comprising part of the cartridge stores data as mentioned above, describing the file names, customer information, application and file space remaining on the tape or used on the tape, and dates of storage of files. A summary information describing the data items stored on the tape can be obtained by automatically  
15 interrogating the transponder memory storage device in the cartridge, which is read by the tape drive device by inductive coupling to a transceiver chip forming part of the memory device, and which can be displayed on the visual display unit of the host device. Reading the content of the memory device involves physically picking up the data cartridge, putting the data cartridge in the tape drive of the  
20 host device, operating a keypad or pointing device, for example a mouse or tracker ball, to select menu items from an application program on the host device, in order to identify the information describing the data content of the tape.

In order to print a label for the tape, this involves running an application stored on the host device, perhaps manually entering the information describing  
25 the data on the tape via a keyboard and/or pointing device and then printing out the label. A problem in printing a label for the tape cartridge by this mechanism is the time taken to print each label. For example, for a person wishing to find a particular item of data in a library, the first time a person enters the library on a particular day, he may have to pick an unlabeled tape cartridge which the person  
30 thinks the data item may reside on, and in order to check the data on the

cartridge needs to turn on the host computer device, wait for the host device to boot up and initialise, taking possibly a minute or two, select the application required for reading the memory device on the cartridge, again perhaps taking of the order of one or two minutes, and then read the data. If the data cartridge  
5 does not contain the required data, then the person needs to remove the cartridge from the drive, which may or may not involve a delay in the software controlling the tape drive unit allowing the person to remove the tape, and then select a different tape from the shelf. For the second, subsequent tape cartridge inspected, the time delays will be shorter than inspecting the first data cartridge,  
10 since the host device does not need to be booted up and initialised. However, there is still a significant delay in interrogating the memory device on the cartridge through the application software provided by the host device.

Having found the data cartridge containing the required data, in order to  
15 print a label for attachment to the cartridge, the person needs to call up the application software for printing the label, perhaps enter details describing the cartridge manually into the printing application software, using a keyboard and/or pointing device and before printing make sure that an attached printer device is turned on. In order to turn the printing device on, the printing device may go  
20 through a print initialisation routine, which in the case of an inkjet printer may take several minutes if used for the first time on a particular day, and providing there is sufficient print medium in the printer device, then a label can be printed. However, since many printer devices use paper as a print medium, it may be necessary to find and insert sheets of adhesive labels into the printer in order to  
25 print out an adhesive label for the tape cartridge.

Therefore, conventionally it may take anything of the order of 10 to 15 minutes to print a label for a data cartridge, including all the time delays involved in booting up a host device and initialising a printer. Additionally, this assumes  
30 that a host computer device is available at the location of the library, which it may

not be, in which case an additional delay is incurred in taking the tapes to the host device for the data to be reloaded. Although the time delay taken to print a label for subsequent tape cartridges after the first will reduce per cartridge, the cataloguing and identification of data stored on existing legacy libraries of tape data storage cartridges is a time consuming process, whether the library is a manual access library, or an automated library having a robotic device for selected cartridges.

In all cases, in order to improve ease and accuracy of access to the required data, a system for checking the data stored on a tape and labeling the tape accurately will be of benefit.

#### **Summary of the Invention**

Specific methods according to the present invention, recognise that information contained on transponder memory devices in a data storage cartridge can be used to provide a rapid means of access to a data set which can be utilised to identify the cartridge and to produce a cartridge label.

Conceptually, the specific embodiments of the invention aim to provide an integrated printer with built-in radio frequency capability to read information stored on a memory device integrated into a data storage medium cartridge casing which automatically prints the information read from the memory device in a pre-formatted user-readable form on a label suited to the specific cartridge casing type.

25

According to first aspect of the present invention there is provided a hand holdable portable reader device capable of reading data stored in a memory device attached to a cartridge-type data storage device said reader device comprising:

30

a signal receiver means capable of receiving data signals emitted from said data storage device;

5 a memory means capable of storing said data signals received by said receiver means;

a printer device configured to print at least some of said data received from said receiver means onto a print media; and

10 a processor device operable to control said printer to print said data on said print media.

Preferably said printer is configured for printing a label of a size and shape suitable for direct attachment to a said data storage cartridge.

15

Preferably said processor is configured to select a predetermined selection of information items describing said data storage device from said data received from said data storage device, and to control said printer to print said predetermined set of information items onto a said print media in a predetermined  
20 format.

The device may further comprise a keypad control means, said keypad control means being finger operable for inputting user commands to said processor, for controlling said display device for scanning through data items describing said data storage device, said data items retrieved from said memory  
25 means.

The device may further comprise a keypad control means configured for operating such that upon a user activating a key of said keypad control means,

said printer device operates to print a predetermined selection of data items describing said data storage device, on to said print media.

5 Preferably said processor device is operable under control of a dedicated operating system stored in a read only memory device.

The reader device may further comprise an interface means for interfacing with an external processor.

10 The reader device may further comprise a display means, and said processor operates under control of said operating system and a keypad data entry means to display a selection of user selectable menu items on said display means.

15 The reader device may have a keypad device comprising a print key wherein said processor operates to receive a print signal produced by activation of said print key, and sends a print signal to said printer for printing data items input via said receiver.

20 Preferably said reader device comprises a port adapted to locate said data storage device and said receiver means is located within said port such that when a said data storage device is inserted into said port, a memory device of said data storage device lies in close physical proximity to said receiver means.

25 The reader device may further comprise a housing for accepting a roll of blank labels.

30 Preferably, the reader device comprises a port adapted to locate said data storage device, said port comprising a recess specifically shaped and formed to accept said tape data storage device.

Said reader device may comprise a port adapted to locate said data storage device, said port comprising a surface against which said data storage device may be offered in close proximity to said surface, such that a receiver device may  
5 detect signals transmitted by said data storage device.

The invention includes a hand-holdable portable reader device for reading data from a memory device contained on a data storage device, said reader device comprising:

10

a casing having a port capable of accepting a said data storage device;

reading means for reading data from said memory device of said data storage device, said reading means located in said port;

15

processor means configured for controlling said reading means and for accepting data signals received by said reading means;

memory means containing an operating system for controlling said  
20 processor means by a sequence of command signals;

display means for displaying said data obtained from said receiving means in a user readable format;

25 keypad data entry means capable of receiving input commands for activation of said menu items; and

printer means operable under control of said processor means for printing a label in response to a user command signal input activated by said keypad data

entry means, wherein said label contains at least some of the data read from the memory device of the data storage device.

**Brief Description of the Drawings**

5        For a better understanding of the invention and to show how the same may be carried into effect, there will now be described by way of example only, specific embodiments, methods and processes according to the present invention with reference to the accompanying drawings in which:

10        Fig. 1 illustrates schematically a tape data storage cartridge having an embedded read/write memory accessible by means of a transponder unit within the cartridge, as is known in the prior art;

15        Fig. 2 illustrates schematically a first data storage media reader and printer device according to a first specific embodiment of the present invention, comprising a casing, a port to insert a data storage cartridge for accessing information contained on a memory device on the cartridge, a display screen, a printer and keypad allowing data to be selected by a user;

20        Fig. 3 illustrates schematically internal electronic components of the data storage media reader and printer device of Fig. 2, illustrating interaction with a transponder device on a tape data storage cartridge;

25        Fig. 4 illustrates schematically a command sequence for reading data from a memory device on a tape data storage cartridge, writing it to a memory area of the reader-printer device, and displaying and printing all or a selected set of the data;

Figs. 5A to 5G illustrates schematically displays of predetermined selected data items read from the data storage cartridge, and which appear on the display screen of the first reader-printer device; and

5        Fig. 6 illustrates schematically an example of a layout of a label printed by the first reader-printer device of Fig. 2.

**Detailed Description of the Best Mode for Carrying Out the Invention**

There will now be described by way of example the best mode  
10 contemplated by the inventors for carrying out the invention. In the following description numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be apparent however, to one skilled in the art, that the present invention may be practised without limitation to these specific details. In other instances, well known methods and structures  
15 have not been described in detail so as not to unnecessarily obscure the present invention.

In order to remove errors in cartridge labeling and to improve the speed of labeling, a media-dependent labeling system is envisaged which is specific to a  
20 particular type or design of data storage media device. This uses information contained on a memory device located in the data storage cartridge (the media) to produce a printed cartridge label, where the label attributes can be selected by the user. This system enables cartridge data to be assessed and the cartridge to be labelled without having to access the data stored on the magnetic tape and  
25 hence avoiding the use of a tape driver of a host device. As a result, the information concerning data contained in the cartridge can be assessed rapidly. By integrating a means of reading the information contained on the cartridge memory device with a means of printing this information either directly to a pre-labelled cartridge or to a blank label all within one device, cartridge labels may be  
30 updated accurately and rapidly.

Labeling of a data storage device need not occur at a time when data is recorded on the data storage medium, but labeling can occur retrospectively, and away from a host device having a tape drive mechanism.

5

Additionally, the device may support multiple language sets and fonts for versatility in user readout. This will allow for versatility and accuracy in user access to cartridge data.

10 Specific methods described herein are concerned with the reading of data from solid state memory devices located on data storage devices and writing this data to a memory area and the selection of data from this memory area for display and printing. A media reader and printer device may be used as an independent hand held and portable device.

15

Referring to Fig. 1 herein, there is illustrated schematically a conventional prior art tape data storage cartridge device comprising a cartridge casing 100, containing one or a pair of reels on which is wound an elongate band of magnetic tape, comprising a high capacity data storage medium on which data may be  
20 recorded from a host device such as a computer server device, a personal computer, a workstation, or a computer controlled test instrument. The cartridge contains a solid state programmable memory device 101 within the cartridge casing 100, the memory device comprising a transponder unit, and a read/write memory, which can be written to or read via the transponder unit, which can be  
25 inductively powered by an RF signal generated by a transmitter placed immediately adjacent the cartridge casing, as is known in the art. The height, width, and length dimensions of the cartridge casing 100 and the general layout of the casing, including the positioning of the memory device 101 within the casing, are specific to the particular type and design of tape data storage  
30 cartridge. That is to say the layout of the cartridge is media specific.

Information about the cartridge and the data stored on the cartridge can be stored in the memory device 101. The data stored may include data describing file names of data on the tape, data describing customer information, data  
5 describing an application stored on the tape, data describing an amount of unused memory space remaining on the tape, and dates upon which files were stored.

Referring to Fig. 2 herein there is illustrated a first media reader and labeling  
10 device 200, according to a first specific embodiment of the present invention. The first reader and labeling device comprises a casing 201 of a size, shape and weight which is easily portable by a person, for example of a size and shape which can easily fit into a persons palm, being hand-held, the casing having means 202 for receiving a tape data storage cartridge in the form of a port  
15 arranged to locate a cartridge; an electrically powered printer device 203 capable of producing printed labels from a roll of self-adhesive labels 204; a display device, preferably a liquid crystal display 205; a user input interface 206 having a finger operable keypad; a battery power supply; a receiver device for communicating with a memory storage device on a tape data storage cartridge.  
20 the receiver device being located in or near the cartridge port; and an external port 207 for connecting to an external computer device or processor.

The port for receiving the tape data storage cartridge may comprise a hinged lid having a pair of receiving guides into which the tape data storage  
25 cartridge is slotted, such that when the lid is closed the cartridge is positioned within the casing such that the memory storage device of the cartridge is immediately adjacent the receiver device mounted in the casing, the arrangement being that the receiver device of the reader device is in close physical proximity with the transponder memory storage device of the tape cartridge such that

inductive coupling can occur between the receiver and memory storage device, allowing reading of data from the memory storage device by the receiver.

5 The cartridge receiving port 202 is designed to accept a particular type of data storage cartridge, and may be specific to a particular type of data cartridge product. Port 202 is designed such that when the tape data cartridge is accepted into the port, the memory storage device on the tape data cartridge aligns automatically with an aerial and receiver of the reader device within casing 201.

10 The means for receiving the cartridge preferably operates to secure and hold the cartridge in a position such that the memory storage device on the cartridge is immediately adjacent and opposite the receiver of the reader and labeling device. The port 202 is preferably keyed such that the tape data storage cartridge can only be inserted in one orientation, and to avoid enabling other  
15 types of tape data storage cartridge being inserted into the port.

In a variation of the first embodiment, the port means capable of receiving the tape data storage cartridge may comprise a recess specifically shaped and formed to accept the tape data storage cartridge, or a spring loaded slot  
20 mechanism into which the tape data storage cartridge is inserted.

In a second embodiment, the port may comprise a surface, against which a data storage cartridge is offered, in close proximity to the surface, but not necessarily contacting the surface, such that the receiver device can detect  
25 signals transmitted by the transponder within the cartridge across an air-gap of the order of 20mm or less between receiver and transponder. In this version, it is not necessary that the tape data storage cartridge touches any part of the reader and labeling device in order for data transfer to occur.

Printer 203 contains an easily removable cover portion which accesses a housing for containing the roll of labels. The housing and its cover are designed such that the cover can be easily and quickly removed manually without the need for special tools, and expired roll of labels be easily removed, and a new roll of labels be easily inserted, whereby the roll of labels are automatically aligned with a print-head of the printer on entering the roll of labels into the label housing. Printer device 203 prints out a label 204 of dimension and shape which is specific to the particular data cartridge type and which is large enough to print out predetermined information concerning the tape data cartridge in a layout and form which fits on the label which can be easily adhered to the tape data cartridge.

Keypad 206 comprises an up scroll finger-operable button for scrolling a selection of memory items displayed on display device 205 in an upward direction; a down scroll button for scrolling the memory items in a downward direction; and a print button.

Referring to Fig. 3 herein, there is further illustrated schematically components of the first reader and labeling device, configured for reading, displaying and printing data onto a label from a transponder 300 having a read/write memory 301 and an aerial 302 in a tape data storage cartridge.

The reading and labeling device comprises an aerial 303, a receiver 304, a processor 305, a programmable memory area 306, a control interface 307, a display 308, a Read Only Memory (ROM) 309 containing an operating system, a keypad 310 for entering instructions from a user, and a printer device 311. Interface 307 is capable of unloading to or down from an external device 312 having a processor.

The processor 305 has a relatively small amount of separate memory 306 of the order of 1 MByte or less, and is limited practically by the smallest size of memory chip commercially available. Alternatively, the processor 305 may be constructed integrally with memory area 306 on a same chip, for example a known Power PC® chip. In the best mode, to achieve compact size and ease of manufacture, the components are as integrated as possible with the processor, and preferably include a built-in operating system in read only memory ROM 309, on a same chip as processor 305.

The aerial 303 and receiver 304 are used to receive data from the memory device 300 of the cartridge, which uses an electrically erasable programmable read only memory (EEPROM) as read/write memory area 301. With the data storage cartridge inserted in the reader device, the aerial 302, of the memory device, forms a contact less interface with the aerial 303 of the reader device using an inductive coupling scheme using a magnetic field to transmit data to the receiver 304. In the best mode, the protocol used to transmit information by the inductive coupling scheme is known as the MIFARE ® system developed by Phillips/Mikron of the type presently employed in "Smart" credit card technology for use in personal banking applications and which is known in the art. Advantages and features of this system as used by the first embodiment include a high reliability; operating frequency 13.56 MHz; and an anti-collision protocol, which provides an ability to handle several transponders in close proximity without interference.

Aerial 303 of the identification and labeling device is positioned such that when a tape cartridge having a cartridge aerial 302 is positioned in the cartridge receiving means 202 of the reader device, the two aerals are positioned a distance less than or equal to 20 mm from each other, so that inductive coupling can occur between the two aerals. Over such a range this yields coupling factors between aerals of the order 1 to 10% and transmission speeds of the order 100

Kbps between the aerals. Receiver 305 of the identification and labeling device transmits an inductive signal which is received by the transponder 301 of the tape cartridge, and which powers the transponder memory storage device in the tape cartridge, such that the transponder is able to emit signals describing the content of the memory storage area 301 across an air gap between the two aerals, which is received by receiver 303. Alternatively, transmission of data signals between the memory device and the reader-labeling device may be within the infra-red range of frequencies.

10        Data read from the memory device 300 in this manner is written via the processor 305 to programmable random access memory, RAM 306, where a copy of all read data is maintained. Data stored in the RAM 306 is displayed on the display screen 308 or is accessed via external processor 312 using the control interface 307.

15        Referring to Fig. 4 herein, there is illustrated schematically a process for operating the reader and labeling device implemented as a set of command sequences performed by the processor 305 to write data received from the cartridge transponder to internal memory 306, and to display the data on the display device 308. The command sequences provide for selecting a required data set and printing a label.

20        The first reader and labeling device may operate in two basic modes of operation. In the first mode of operation, a tape data storage cartridge is input into port 202, and LCD display device 205 and keypad 206 are used to read information stored on the memory storage device describing a content, and characteristics of the tape cartridge itself, and of data stored on the tape cartridge.

In a second mode of operation, a predetermined set of data stored on the memory of the tape data storage cartridge is printed onto a label 204. The first and second modes of operation may be operated independently of each other. That is to say, it is possible to read the information stored on the memory device  
5 on the cartridge without printing out any of that information, and it is possible to print the predetermined set of information on a label without requiring use of the LCD display device 205 or scrolled menu which appears on the device.

A first mode of operation will now be described. A user places a tape data  
10 cartridge into the receiving port 202 of the first reader and labeling device, thereby locating the cartridge firmly in the casing 201 of the device in a position where the transponder memory device 300 of the cartridge lies in close physical proximity to aerial 303 and receiver 304 of the reader and labeling device. Processor 305 under control of operating system stored in ROM 309 operates in  
15 an initial state 400, from which the cartridge port is periodically polled in step 401. All transponders 300 within the operating range return a 10 byte alpha-numeric serial number. If no memory device is detected in the port in step 402, the cartridge port is presumed empty, and the processor idles through the initial state, and continues to poll the cartridge port in step 401. The cartridge slot is  
20 presumed empty if no serial number is returned. Consequently an external detector device incorporated in the cartridge port of the reader device may be polled in step 403 to check whether a cartridge is inserted into the port 202. If no cartridge is detected, the processor returns to initial state 400, continuously polling the cartridge slot in step 401 and/or polling the detector in step 403. If a  
25 memory device is detected in steps 403 or 401, the processor enters a memory device detected state 404 from which the processor reads data received by receiver 304 via aerial 303. Receiver 304 continuously transmits a power signal to the transponder 300 in the tape cartridge in order to allow the transponder to transmit signals through aerial 302 containing data concerning the information  
30 stored on the read/write memory device 301. Transmission of the power signal

across the air gap by aerial 303 may be dependent upon the sensor within the reader and labeling device casing being activated by insertion of a tape data storage cartridge. When no cartridge is inserted into the port, the RF power signal may be interrupted, so as to conserve power in the battery.

5

In step 406, data read from the memory device through receiver 304 is directed by the processor 305 into random access memory 306. Data can be selected from the random access memory in step 407 for display on display device 308 in step 408. Display of data from the RAM is accessed through operation of a menu system in step 409. Initially, predetermined data, for example a serial number of the cartridge which has been read from the memory device may be displayed on the display device 308. Referring to Fig. 5A herein, there is illustrated schematically an example of information displayed on display device 205, comprising a serial number of a tape cartridge. Upper and lower scroll icons 500, 501 may appear on display 205, giving a visual indication to the operator that to access further items of data, the upper and lower scroll buttons of the keypad 206 need to be activated. In step 410 a user may enter keypad entries, for example pressing a scroll button which scrolls through display items as illustrated in Figs. 5B to 5G herein under control of the operating system stored in ROM 309, in menu system 409. The operating system stored in ROM 309 is specifically configured from a knowledge of the format and layout of the information items stored as data in the memory device of the cartridge. By scrolling through the menu, by operating the keypad scroll buttons, display of the serial number of the tape, the date the tape was last used, an amount of memory remaining on the tape, names of back up sessions stored on the tape e.g. "Full Backup Monday 3/8/98", a number of times the tape has been used, a number of errors on the tape and an option to print a label containing a predetermined set of information items describing data stored on the tape may be accessed. If, in response to a 'print label' display as illustrated in Fig 5G, a key on keypad 206 is pressed, then in step 409, processor 305 sends a signal to printer 311, along with

signals describing the information to be printed on the label, which activates printer 311 to print a label 204 in a format suitable for direct attachment to the tape data cartridge. The user may then release the port cover and remove the cartridge, detach the label 204 from its backing paper and stick the label on the  
5 cartridge. The label characteristics may be determined by user input via the menu system 409. Characteristics include a chosen language set, font size and type, and in this way allow the user to customise the label as necessary.

In a second mode of operation, where it is not required to identify or  
10 interrogate information contained on a memory of the tape cartridge, but just to simply print a label to stick on the tape data cartridge, steps 400-406 as described above are repeated. The user places the tape cartridge in the port 202, closes the cover, and the processor interrogates the memory device on the cartridge and stores data received from the memory device in random access  
15 memory 306 as described herein above. However, in the second mode of operation the user activates a print key on key pad 206 in step 410 which activates direct printing of a predetermined set of information items received from the memory device 300. An example of a printed label is illustrated in Fig. 6 herein. The predetermined set of information items may be selected from the set:  
20 a serial number of the tape; a date the tape was last used; an amount of memory space remaining on the tape; a file name of a first file on the tape; a file name of the last file on the tape, a name of a back up session stored on the tape. This list of predetermined selected information items is exemplary, and not exhaustive, and the exact information items which are printed on the label depend upon the  
25 exact information items which are stored on the memory on the cartridge tape, which are specific to the particular media format of the tape cartridge and reader-labeling device, as will be understood by those skilled in the art. Activation of the print key causes automatic printing of the label containing the predetermined information items. The user then releases the cartridge from the port 202, sticks  
30 the label on the cartridge and may return the cartridge back to the shelf. An

advantage of the second mode of operation is speed of labeling of cartridges. For example, where hundreds or thousands of tape cartridges are stored in a library, the handheld reader-labeling device may be used to efficiently and quickly label a large number of tape cartridges manually with a pre-selected set of  
5 information describing the tape cartridge and its contents.

**Claims:**

1. A hand holdable portable reader device (200) capable of reading data stored in a memory device attached to a cartridge-type data storage device said reader device comprising:

5

a signal receiver means (304) capable of receiving data signals emitted from said data storage device;

10

a memory means (306) capable of storing said data signals received by said receiver means;

a printer device (311) configured to print at least some of said data received from said receiver means onto a print media; and

15

a processor device (305) operable to control said printer to print said data on said print media.

20

2. The reader device as claimed in claim 1, wherein said printer is configured for printing a label of a size and shape suitable for direct attachment to a said data storage cartridge.

25

3. The reader device as claimed in claim 1, wherein said processor is configured to select a predetermined selection of information items describing said data storage device from said data received from said data storage device, and to control said printer to print said predetermined set of information items onto a said print media in a predetermined format.

30

4. The reader device as claimed in claim 1, further comprising a keypad control means, and a display device, said keypad control means being finger operable for inputting user commands to said processor, for controlling said

display device for scanning through data items describing said data storage device, said data items retrieved from said memory means.

5        5.        The reader device as claimed in claim 1, further comprising a keypad control means configured for operating such that upon a user activating a key of said keypad control means, said printer device operates to print a predetermined selection of data items describing said data storage device, on to said print media.

10       6.        The reader device as claimed in claim 1, wherein said processor device is operable under control of a dedicated operating system stored in a read only memory device.

15       7.        The reader device as claimed in claim 1, further comprising an interface means for interfacing with an external processor.

20       8.        The reader device as claimed in claim 1, wherein said reader device comprises a display means, and said processor operates under control of said operating system and a keypad data entry means (310) to display a selection of user selectable menu items on said display means.

25       9.        The reader device as claimed in claim 1, having a keypad device (310) comprising a print key wherein said processor operates to receive a print signal produced by activation of said print key, and sends a print signal to said printer for printing data items input via said receiver.

10.       The reader device as claimed in claim 1, further comprising a port (202) adapted to locate said data storage device and said receiver means is located within said port such that when a said data storage device is inserted into

said port, a memory device of said data storage device lies in close physical proximity to said receiver means.

11. The reader device as claimed in claim 1, further comprising a  
5 housing for accepting a roll of blank labels.

12. The reader device as claimed in claim 1, further comprising a port  
adapted to locate said cartridge type data storage device, said port comprising a  
recess specifically shaped and formed to accept said tape data storage device.

10

13. The reader device as claimed in claim 1, further comprising a port  
adapted to locate said cartridge type data storage device, said port comprising a  
surface against which said data storage device may be offered in close proximity  
to said surface, such that a receiver device may detect signals transmitted by  
15 said data storage device.

14. A hand-holdable portable reader device (200) for reading data from  
a memory device contained on a data storage device, said reader device  
comprising:

20

a casing (201) having a port capable of accepting a said data storage  
device;

reading means for reading data from said memory device of said data  
25 storage device, said reading means located in said port;

processor means (305) configured for controlling said reading means and  
for accepting data signals received by said reading means;

memory means containing an operating system for controlling said processor means by a sequence of command signals;

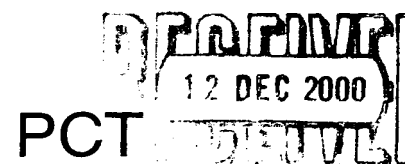
display means (308) for displaying said data obtained from said receiving  
5 means in a user readable format;

keypad (310) data entry means capable of receiving input commands for activation of said menu items; and

10 printer means (311) operable under control of said processor means for printing a label in response to a user command signal input activated by said keypad data entry means, wherein said label contains at least some of the data read from the memory device of the data storage device.

# PATENT COOPERATION TREATY

From the:  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY



To:

LAWMAN, Matthew John Mitchell  
HEWLETT- PACKARD Limited  
Intellectual Property Section  
Filton Road  
Stoke Gifford  
Bristol BS34 8QZ  
GRANDE BRETAGNE

## WRITTEN OPINION

(PCT Rule 66)

Date of mailing (day/month/year) 06.12.2000	
Applicant's or agent's file reference 30980107 WO1	<b>REPLY DUE</b> within 3 month(s) from the above date of mailing
International application No. PCT/GB00/00676	International filing date (day/month/year) 25/02/2000
Priority date (day/month/year) 24/03/1999	
International Patent Classification (IPC) or both national classification and IPC G06K17/00	
Applicant HEWLETT-PACKARD COMPANY et al.	

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
  - I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☐ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain document cited
  - VII ☒ Certain defects in the international application
  - VIII ☒ Certain observations on the international application
3. The applicant is hereby **invited to reply** to this opinion.
 

**When?** See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

**How?** By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

**Also:** For an additional opportunity to submit amendments, see Rule 66.4.  
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.  
For an informal communication with the examiner, see Rule 66.6.

**If no reply is filed**, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the International preliminary examination report must be established according to Rule 69.2 is: **24/07/2001**.

Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer / Examiner  Grob, M  Formalities officer (incl. extension of time limits) Benigar, M Telephone No. +49 89 2399 2996
---	--



## I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*):

**Description, pages:**

1-20 as originally filed

**Claims, No.:**

1-14 as originally filed

**Drawings, sheets:**

1/7-7/7 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

#### **VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

#### **VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:  
**see separate sheet**

**Re Item VII**

**Certain defects in the international application**

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents US-A-5 455 409, US-A-5 592 596, and US-A-4 141 045 is not mentioned in the description, nor are these documents identified therein.
- 1.1 If new claims are filed, the description (cf pages 6-9) should be brought into conformity with these new claims as required by Rule 5.1(a)(iii) PCT. In addition, the description (cf introductory paragraph on page 1; line 19 on page 5; line 8 on page 9; and line 10 on page 11) gives the misleading impression that the invention relates to: a) recording medium cartridges, and b) some sort of method. However, the present claims merely refer to a hand-holdable portable reading device!
- 1.2 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

**Re Item VIII**

**Certain observations on the international application**

1. It is unclear in claim 1 (see first two lines) whether the "data describing [the] cartridge-type data storage device" are intended to be the data stored, for example, on the tape of the cartridge-type data storage device or in a memory device (EEPROM) attached to the cartridge-type data storage device. As a result, it is not clear what type of "signal receiver means" is capable of receiving data signals emitted from the data storage device (cf lines 5-6 of claim 1) and therefore the clarity requirement of Article 6 PCT is not met. To overcome this clarity problem it would be appropriate to replace the word "describing" (cf second line of claim 1) by "stored in a memory device attached to".
- 1.1 Lines 11-12 of claim 1 give the impression that all of the data received/read (i.e. said data) are printed. However, in some embodiments (cf claim 3), only items selected from the received data are printed. Hence, it would be appropriate to

include "at least some of" after the words "to print" at line 11 of claim 1.

- 1.2 In claim 4, the "display device" (cf line 3) is lacking an antecedent.
- 1.3 Claim 14 does not solve the problem of removing errors in cartridge labelling and improving the speed of labelling (cf page 10, lines 18-19 of the description), because it is lacking the essential feature of printing a label **containing at least some of the data read from the memory device of the storage device**. Hence, claim 14 is not clear (Article 6 PCT).
- 1.4 Claim 14 defines essentially all of the features of claim 1. Hence, claims 1 and 14 are not concise, contrary to Article 6 PCT. It would be appropriate to draft claim 14 as a dependent claim.



EPA/EPO/OEB  
D-80298 München  
☎ +49 89 2399-0  
TX 523 656 epmu d  
FAX +49 89 2399-4465

Europäisches  
Patentamt

Generaldirektion 2

European  
Patent Office

Directorate General 2

Office européen  
des brevets

Direction Générale 2

## Correspondence with the EPO on PCT Chapter II demands

In order to ensure that your PCT Chapter II demand is dealt with as promptly as possible you are requested to use the enclosed self-adhesive labels with any correspondence relating to the demand sent to the Munich Office.

One of these labels should be affixed to a prominent place in the upper part of the letter or form etc. which you are filing.

# PCT

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference  
(if desired) (12 characters maximum) 30980107 WO1

**Box No. I TITLE OF INVENTION**

INTELLIGENT MEDIA READER AND LABEL PRINTER

**Box No. II APPLICANT**

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

Hewlett-Packard Company  
3000 Hanover Street  
Palo Alto  
CA 94304  
US

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant  
for the purposes of:

☐ all designated  
States

☒ all designated States except  
the United States of America

☐ the United States  
of America only

☐ the States indicated in  
the Supplemental Box

**Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)**

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

GOLD, Stephen  
Rock Cottage  
Stoke Lane  
Winterbourne Down  
BRISTOL BS36 1DJ  
GB

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box  
is marked, do not fill in below.)

State (that is, country) of nationality:

GB

State (that is, country) of residence:

GB

This person is applicant  
for the purposes of:

☐ all designated  
States

☐ all designated States except  
the United States of America

☒ the United States  
of America only

☐ the States indicated in  
the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

**Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**

The person identified below is hereby/has been appointed to act on behalf  
of the applicant(s) before the competent International Authorities as:

☒ agent

☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

LAWMAN, Matthew John Mitchell  
Hewlett-Packard Limited  
Intellectual Property Section  
Filton Road  
Stoke Gifford  
BRISTOL BS34 8QZ  
GB

Telephone No.

+ 44 117 312 9946

Facsimile No.

+ 44 117 312 8941

Teleprinter No.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

## Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

*If none of the following sub-boxes is used, this sheet should not be included in the request.*

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

CRIGHTON, Ian Peter  
1 Old Manor Cottages  
Winterbourne Hill  
Winterbourne  
BRISTOL BS36 1JS  
GB

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:  
GB

State (that is, country) of residence:  
GB

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

**Box No.V DESIGNATION OF STATES**

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

**Regional Patent**

- ☐ **AP ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☐ **EA Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☐ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

**National Patent (if other kind of protection or treatment desired, specify on dotted line):**

- |   |   |
|---|---|
| <input type="checkbox"/> AE United Arab Emirates                  | <input type="checkbox"/> LR Liberia                                   |
| <input type="checkbox"/> AL Albania                               | <input type="checkbox"/> LS Lesotho                                   |
| <input type="checkbox"/> AM Armenia                               | <input type="checkbox"/> LT Lithuania                                 |
| <input type="checkbox"/> AT Austria                               | <input type="checkbox"/> LU Luxembourg                                |
| <input type="checkbox"/> AU Australia                             | <input type="checkbox"/> LV Latvia                                    |
| <input type="checkbox"/> AZ Azerbaijan                            | <input type="checkbox"/> MA Morocco                                   |
| <input type="checkbox"/> BA Bosnia and Herzegovina                | <input type="checkbox"/> MD Republic of Moldova                       |
| <input type="checkbox"/> BB Barbados                              | <input type="checkbox"/> MG Madagascar                                |
| <input type="checkbox"/> BG Bulgaria                              | <input type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input type="checkbox"/> BR Brazil                                | <input type="checkbox"/> MN Mongolia                                  |
| <input type="checkbox"/> BY Belarus                               | <input type="checkbox"/> MW Malawi                                    |
| <input type="checkbox"/> CA Canada                                | <input type="checkbox"/> MX Mexico                                    |
| <input type="checkbox"/> CH and LI Switzerland and Liechtenstein  | <input type="checkbox"/> NO Norway                                    |
| <input type="checkbox"/> CN China                                 | <input type="checkbox"/> NZ New Zealand                               |
| <input type="checkbox"/> CR Costa Rica                            | <input type="checkbox"/> PL Poland                                    |
| <input type="checkbox"/> CU Cuba                                  | <input type="checkbox"/> PT Portugal                                  |
| <input type="checkbox"/> CZ Czech Republic                        | <input type="checkbox"/> RO Romania                                   |
| <input type="checkbox"/> DE Germany                               | <input type="checkbox"/> RU Russian Federation                        |
| <input type="checkbox"/> DK Denmark                               | <input type="checkbox"/> SD Sudan                                     |
| <input type="checkbox"/> DM Dominica                              | <input type="checkbox"/> SE Sweden                                    |
| <input type="checkbox"/> EE Estonia                               | <input type="checkbox"/> SG Singapore                                 |
| <input type="checkbox"/> ES Spain                                 | <input type="checkbox"/> SI Slovenia                                  |
| <input type="checkbox"/> FI Finland                               | <input type="checkbox"/> SK Slovakia                                  |
| <input checked="" type="checkbox"/> GB United Kingdom             | <input type="checkbox"/> SL Sierra Leone                              |
| <input type="checkbox"/> GD Grenada                               | <input type="checkbox"/> TJ Tajikistan                                |
| <input type="checkbox"/> GE Georgia                               | <input type="checkbox"/> TM Turkmenistan                              |
| <input type="checkbox"/> GH Ghana                                 | <input type="checkbox"/> TR Turkey                                    |
| <input type="checkbox"/> GM Gambia                                | <input type="checkbox"/> TT Trinidad and Tobago                       |
| <input type="checkbox"/> HR Croatia                               | <input type="checkbox"/> TZ United Republic of Tanzania               |
| <input type="checkbox"/> HU Hungary                               | <input type="checkbox"/> UA Ukraine                                   |
| <input type="checkbox"/> ID Indonesia                             | <input type="checkbox"/> UG Uganda                                    |
| <input type="checkbox"/> IL Israel                                | <input checked="" type="checkbox"/> US United States of America       |
| <input type="checkbox"/> IN India                                 | <input type="checkbox"/> UZ Uzbekistan                                |
| <input type="checkbox"/> IS Iceland                               | <input type="checkbox"/> VN Viet Nam                                  |
| <input checked="" type="checkbox"/> JP Japan                      | <input type="checkbox"/> YU Yugoslavia                                |
| <input type="checkbox"/> KE Kenya                                 | <input type="checkbox"/> ZA South Africa                              |
| <input type="checkbox"/> KG Kyrgyzstan                            | <input type="checkbox"/> ZW Zimbabwe                                  |
| <input type="checkbox"/> KP Democratic People's Republic of Korea |   |
| <input type="checkbox"/> KR Republic of Korea                     |   |
| <input type="checkbox"/> KZ Kazakhstan                            |   |
| <input type="checkbox"/> LC Saint Lucia                           |   |
| <input type="checkbox"/> LK Sri Lanka                             |   |

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

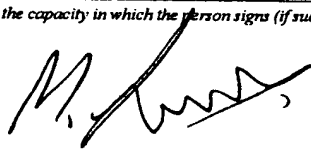
<b>Box No. VI PRIORITY CLAIM</b>					<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:			
		national application: country	regional application: regional Office	international application: receiving Office	
item (1) 24 March 1999 (24/3/99)	99302266.4	EP			
item (2)					
item (3)					

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

<b>Box No. VII INTERNATIONAL SEARCHING AUTHORITY</b>		
<b>Choice of International Searching Authority (ISA)</b> (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA /	<b>Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):</b> Date (day/month/year)      Number      Country (or regional Office) 5 October 1999      99302266.4      EP	

<b>Box No. VIII CHECK LIST; LANGUAGE OF FILING</b>	
This international application contains the following number of sheets: request : 4 description (excluding sequence listing part) : 20 claims : 4 abstract : 1 drawings : 7 sequence listing part of description : Total number of sheets : 36	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input checked="" type="checkbox"/> separate signed power of attorney 3. <input checked="" type="checkbox"/> copy of general power of attorney, reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input checked="" type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input checked="" type="checkbox"/> other (specify): Search report
Figure of the drawings which should accompany the abstract: 2	Language of filing of the international application: English

<b>Box No. IX SIGNATURE OF APPLICANT OR AGENT</b>	
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request). <div style="text-align: center; margin-top: 20px;">   <b>Matthew John Mitchell Lawman</b> </div>	

For receiving Office use only	
1. Date of actual receipt of the purported international application: 3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application: 4. Date of timely receipt of the required corrections under PCT Article 11(2): 5. International Searching Authority (if two or more are competent): ISA /	2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received: 6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.

For International Bureau use only	
Date of receipt of the record copy by the International Bureau:	

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ EP

# PCT

## CHAPTER II

### DEMAND

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only	
Identification of IPEA	Date of receipt of DEMAND
<b>Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION</b>	
Applicant's or agent's file reference 30980107 WO1	
International application No. PCT/GB00/00676	International filing date (day/month/year) 25 February 2000 (25/02/00)
(Earliest) Priority date (day/month/year) 24 March 1999 (24/03/99)	
Title of invention INTELLIGENT MEDIA READER AND LABEL PRINTER	
<b>Box No. II APPLICANT(S)</b>	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) Hewlett-Packard Company 3000 Hanover Street Palo Alto CA 94304 USA	
Telephone No.:	
Facsimile No.:	
Teleprinter No.:	
State (that is, country) of nationality: US	State (that is, country) of residence: US
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) GOLD, Stephen Rock Cottage Winterbourne Down BRISTOL BS36 1DJ GB	
State (that is, country) of nationality: GB	State (that is, country) of residence: GB
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) CRIGHTON, Ian Peter 1 Old Manor Cottages Winterbourne Hill Winterbourne BRISTOL BS36 1JS GB	
State (that is, country) of nationality: GB	State (that is, country) of residence: GB
<input type="checkbox"/> Further applicants are indicated on a continuation sheet.	

**Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**The following person is ☒ agent ☐ common representativeand ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*LAWMAN, Matthew John Mitchell  
Hewlett-Packard Limited  
Intellectual Property Section  
Filton Road  
Stoke Gifford  
BRISTOL BS34 8QZ GB

Telephone No.:

+44 117 312 9946

Facsimile No.:

+44 117 312 8941

Teleprinter No.:

☐ **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments: \***

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filedthe description ☐ as originally filed☐ as amended under Article 34the claims ☐ as originally filed☐ as amended under Article 19 (together with any accompanying statement)☐ as amended under Article 34the drawings ☐ as originally filed☐ as amended under Article 342. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

\* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

**Language for the purposes of international preliminary examination:** ENGLISH☐ which is the language in which the international application was filed.☐ which is the language of a translation furnished for the purposes of international search.☐ which is the language of publication of the international application.☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.**Box No. V ELECTION OF STATES**The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes not to elect:

**Box No. VI CHECK LIST**

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- |  |        |
|--|--------|
| 1. translation of international application                              | sheets |
| 2. amendments under Article 34   | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | sheets |
| 4. copy (or, where required, translation) of statement under Article 19  | sheets |
| 5. letter  | sheets |
| 6. other ( <i>specify</i> )  | sheets |

For International Preliminary Examining Authority use only

received                      not received

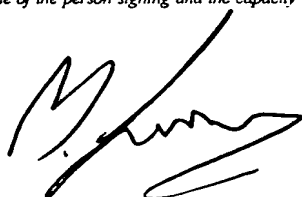
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- |  |   |
|--|---|
| 1. <input checked="" type="checkbox"/> fee calculation sheet                             | 4. <input type="checkbox"/> statement explaining lack of signature                                  |
| 2. <input type="checkbox"/> separate signed power of attorney                            | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input type="checkbox"/> copy of general power of attorney, reference number, if any: | 6. <input type="checkbox"/> other ( <i>specify</i> ):   |

**Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE**

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).



Matthew John Mitchell Lawman

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. ☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on: